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CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT

ORIGINAL ARTICLES

Development of Provincial Medical Education Illustrated in the Life and Work of Charles White of Manchester: White on Puerperal Fever — The Work of Semmelweis — Phlegmasia Alba Dolens — White as a Surgeon — A Study in Evolution — Provincial Medical Education. By Prof. A. H. BURGESS, F.R.C.S. (*illus*) 235

Chemotherapy of Gas Gangrene: Material and Methods—Experimental. By Prof. JAMES MCINTOSH, M.D., and F. R. SELBIE, M.D. (*illus.*) 240

Meningitis following Spinal Anæsthesia: Report on 11 Cases: Autopsy Findings—Ætiology. By H. J. BARRIE, B.M. 242

Culture of Intestinal Protozoa. By Prof. S. ADLER, M.R.C.P., and ANNIE FONER, M.R.C.S. 243

Dysentery due to *B. dysenteriæ* Newcastle: Prevalence in Edinburgh. By A. J. RHODES, M.R.C.P.E. 244

MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE: Section of Otology; Psychological Aspects of Deafness 244

PUBLIC HEALTH

Trichiniasis Further South 266

Infectious Disease in England and Wales 266

Incidence of Influenza 266

LEADING ARTICLES

THE HERITABLE FACTOR IN EPILEPSY 247

INFANCY OF THE BLOOD-CELL 248

A LIPOID DISORDER 249

ANNOTATIONS

Cow's Milk for Neonatal Hæmorrhage 250

The First Permanent Molar 250

Chloroform in Obstetrics 251

Serous Fluid 251

Leukoplakia and Kraurosis 252

Sex and Age Differences in Tuberculosis 252

REVIEWS OF BOOKS

The Orientation of Animals. By G. S. Fraenkel and D. L. Gunn 245

The World and the Atom. By C. Møller and Ebbe Rasmussen 245

Fractures. By George Perkins, F.R.C.S. 246

Textbook of Medicine. Edited by J. J. Conybeare, F.R.C.P. 246

Principles of Hematology. By Russell L. Haden, M.D. 246

Hæmorrhoids and their Treatment: The Varicose Syndrome of the Rectum. By Kasper Blond, M.D. 246

Rectal Surgery. By W. E. Miles, F.R.C.S. 246

Cushny's Pharmacology and Therapeutics. Revised by G. W. Edmunds, M.D., and J. A. Gunn, F.R.C.P. 246

IN ENGLAND NOW

A Running Commentary by Peripatetic Correspondents 257

SPECIAL ARTICLES

The Prevalent Diseases of Libya: Malaria—Leishmaniasis — Relapsing Fever—Typhus—Sandfly Fever and Dengue Fever —Dietetic Diseases—Dysentery — Helminthic Diseases—Venereal Diseases. By PHILIP MANSON-BAHR, F.R.C.P. (*illus.*) 253

A Conference on A.R.P.: The Shelters — The Homeless 255

Medicine and the Law: Damages for Mental Shock 265

Scotland: Carnegie Trust —Poor Law Stigma 266

OBITUARY

Prof. William Bulloch, M.D., F.R.S. (*with portrait*) 263

Harold Scurfield, M.D. (*with portrait*) 264

Robert Craig Dun, F.R.C.S. 264

James Allan, M.D. 264

Surgeon Lieutenant Geoffrey Raymond Edward Maxted, M.B. (*with portrait*) 265

Surgeon Lieutenant Robert Dudley Roper, M.B. 265

Dr. Elizabeth Hurdon 265

Sir Pendrill Varrier-Jones. 264

Dr. William Taylor Doyle Allen 263

PARLIAMENT

Notes on Current Topics: Universities and War Damage 262

Question Time: Financing of Rest Centres—National Health Insurance Benefits—Diphtheria Immunisation in Scotland—Mental Hospital Staff 262

LETTERS TO THE EDITOR

Sulphadiazine (Dr. Perrin H. Long) 259

Artificial Shortage of Doctors (Colonel J. M. Weddell, Dr. C. Carter Shaw, Mr. Bagot Walters, F.R.C.S.) 259

Paul-Bunnell Test in Glandular Fever (Dr. M. C. G. Israëls) 260

Endemic Fluorosis (Dr. E. V. Suckling) 260

Things to Come (Dr. Gordon Ward, Dr. A. D. Willis) 260

Treatment of War Neurosis (Dr. Maurice B. Wright) 261

A Blasted Horse—and Others (Mr. H. F. Buxton) 261

MEDICAL NEWS

University of Cambridge 267

Royal College of Surgeons of England 267

University of Sheffield 267

Pharmaceutical Students and the Army 267

Davyhulme Military Hospital Medical Society 267

Chartered Society of Massage and Medical Gymnastics: Mobile Physiotherapy Unit 267

Royal Society of Medicine 268

Hospital for Sick Children, Great Ormond Street 256

NOTICES

Owl's-Eye View of Diet 268

Astley Cooper 268

War Psychiatry 249

The Inconstancy of Milk 266

Subscription Offer to Students 252

LANCET Crossword Solution 268

Births, Marriages and Deaths 267

Appointments 268

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On scrutinising the list of my 80 predecessors I find that I am the first Hunterian orator who is an entirely provincial surgeon—one who has neither received his surgical education in London nor practised his profession there, one as yet untainted with metropolitanism. I mention the fact to excuse my action in departing from the custom of making John Hunter the main theme of discourse; today is a provincial's day out, and I am taking as my text the life and work of Hunter's famous contemporary provincial surgeon, Charles White, of Manchester, born in the same year as John Hunter, his fellow-student and life-long friend.

Charles White, born at Manchester on Oct. 4, 1728, was the only son of Dr. Thomas White who practised there at King Street, and who had not only acquired a great reputation for skill in midwifery but was actually the first in England to perform cæsarean section. Young White received his general education privately, but while little more than a boy he was allowed to assist his father with midwifery cases. At the age of twenty, he was sent to London and joined, at the same time as John Hunter, the school of anatomy of William Hunter, John's elder brother. He afterwards spent a winter at Edinburgh and rejoined his father in 1751. He agitated so actively for the establishment of an infirmary for Manchester that a prominent local merchant, Joseph Bancroft, impressed by White's skill and energy, offered to defray all expenses of an infirmary for one year if he would give his professional services thereat. A house was taken—No. 10, Garden Street, Shudehill—and on June 24, 1752, was opened with 12 beds. This proved so successful that larger premises were soon required and on April 9, 1755, the new Manchester Public Infirmary was opened with 40 beds and a medical staff of 3 physicians and 3 surgeons. The infirmary remained on the same site until 1908 when it was removed to its present premises with 649 beds, and an honorary medical staff of 44.

Charles White, from an engraving.

White married, in 1757, Ann, daughter of John Bradshaw of Bradshaw Hall, Shudehill, by whom he had four sons and four daughters. Two sons entered the medical profession and assisted their father for a time, but all four predeceased him. In 1762 he was elected a fellow of the Royal Society—five years before John and nearly six years before William Hunter received this honour. On the same day he received the grand diploma of the Company of Surgeons, the body which in 1800 became the Royal College of Surgeons in London and in 1843 the Royal College of Surgeons of England. He was one of the founders of the Manchester Literary and Philosophical Society which still flourishes † and for 23 years was its vice-president.

Owing to a disagreement with the board of management in 1790 Charles White, after 38 years' service, resigned from the staff of the infirmary along with the rest of his colleagues. In the same year he and his son Thomas and two other colleagues founded the Manchester Lying-in Charity, precursor of the present combined St. Mary's Hospitals of the city, and he served on its staff for 21 years under the singular title of "man midwife extraordinary." To it he presented his museum of pathological specimens which was unfortunately destroyed by fire in 1847.

Sale Priory.

White's father, in his later years had retired from practice to live at Sale Priory, about six miles from Manchester, and on his death there in 1776 this came into the possession of Charles White who used it as a country residence. In 1803 he contracted ophthalmia which destroyed the sight of his left eye. Nevertheless he continued to practise and even to operate until a similar attack in 1812 left him totally blind. He then retired to Sale Priory where he died on Feb. 20, 1813, at the age of 84, and was buried in Ashton-on-Mersey church.

WHITE ON PUERPERAL FEVER

White's magnum opus was his "Treatise on the management of Pregnant and Lying-in Women," first published in 1773. He dedicated it to his first medical teacher, Dr. William Hunter, then physician extraordinary to Queen Charlotte, "as a small acknowledgment of gratitude for the advantages I received in my education from your instructions, and the kind offices of a friendship with which you have ever since honoured me." The treatise embodied the experience of 27 years of midwifery practice, an experience which had profoundly impressed him with the methods then in vogue. Midwifery was almost exclusively confined to ignorant women whose imperfect knowledge of their art had been handed down orally from their predecessors; medical men were called only in cases presenting unusual difficulty. White described the prevailing practice in these words.

> When the woman is in labour she is often attended by a number of her friends in a small room, with a large fire, which, together with her own pains, throw her into profuse sweats; by the heat of the chamber, and the breath of so many people, the whole air is rendered foul and unfit for respiration. . . . If the woman's pains are not strong enough, her friends are generally pouring into her large quantities of strong liquors, mixed with warm water, and if her pains are very strong, the same kind of remedy is made use of to support her. As soon

* The Hunterian Oration for 1941 delivered before the Royal College of Surgeons of England on Feb. 13.

† Since these lines were written the house of the society has been completely destroyed in the Manchester blitz.

as she is delivered, if she is a person in affluent circumstances she is covered up close in bed with additional clothes, the curtains are drawn round the bed and pinned together, every crevice in the windows and door is stopped close, not excepting even the key-hole, the windows are guarded not only with shutters and curtains but even with blankets, the more effectually to exclude the fresh air, and the good woman is not suffered to put her arm or even her nose out of bed, for

White's bed for the puerperium.

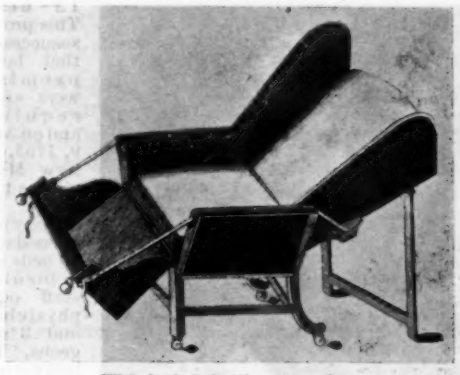
fear of catching cold. She is confined to a horizontal position for many days together, whereby both the stools and the lochia are prevented from having a free exit. . . . The lochia, stagnating in the womb and in the folds of the vagina, soon grow putrid. . . . Amongst the poor people who live in cellars and upon clay ground floors, the air is made still worse by the dampness and closeness of their houses, the want of clean linen and of cleanliness in general . . . nor is it to be wondered at that they are still in a worse situation in hospitals, where a number are crowded not only in one house but in one ward, where the disease is conveyed from one to another by the putrid miasmata lodging in the curtains, bed-clothes and furniture.

Puerperal fever was rife, and the mortality disquieting. White urged that special attention be devoted to all such matters as good hygienic surroundings, scrupulous cleanliness both personal on the part of all attendants and also of any material likely to come in contact with the patient —bed-linen, towels, sponges, instruments—proper ventilation of the lying-in chamber, maintenance of an even and moderate room-temperature so as to avoid either chill or over-heating, and correct posture of the patient after delivery. In hospitals:

If separate apartments cannot be allowed to every patient, at least as soon as the fever has seized one she ought immediately to be moved into another room not only for her immediate safety, but that of the other patients; or it would be still better if every woman were delivered in a separate ward and were to remain there a week or ten days until all danger of this fever is over. . . . Whenever a patient has recovered from this fever and is removed to another room the bedding and curtains should be washed, the floor and woodwork cleansed with vinegar, and it would still add to the salubrity of the apartment if it were stoved with brimstone.

The posture of the patient after delivery was considered by White of great importance, and in his treatise he figured a chair and a bed which he employed, both designed to allow at will of variations in the angle at which the patient is raised from the horizontal. Surgeons will at once recognise this position prescribed by White as identical with that advocated over 100 years later by Fowler, an American surgeon, in the treatment of peritonitis, the object of both White and Fowler being to obtain gravitational drainage. It is refreshing to note that in his system of obstetrics and gynæcology A. H. Curtis (1933), of Chicago, accords the credit to White. White advocated getting the patient out of bed soon after delivery—on the same day, if possible, and certainly not later than the second or third day. As the result of his methods he reported that of the large number of lying-in patients he had delivered he had never lost one from puerperal fever, and of the few cases developing this complication from non-observance of the rules laid down no life had been seriously endangered, nor had any case ended in madness or other disagreeable complaint. He, however, qualified this statement as referable only to patients he had himself attended during the time of delivery, and excluded both those to whom he had been called in consultation after puerperal fever had already developed, and also those requiring the use of instruments. Successful results of White's methods were also reported by Eli Cope—a former pupil—Professor Young of Edinburgh, Robert Collins of the Rotunda and others. Sad to relate, however, a quarter of a century after White's death a serious fall from grace occurred both in the British school and on the Continent largely owing to French teaching. The methods of White and his followers were abandoned and puerperal fever again became prevalent even in the Manchester Lying-in Hospital which White himself had founded. Nor were matters any better in America when in 1843 Dr. Oliver Wendell Holmes used his literary genius to direct public attention to this grave situation.

In Vienna in 1789 there had been appointed a professor of midwifery who had studied White's methods in England, and who, in spite of strong opposition, had introduced them into the Vienna lying-in hospital—Professor Boer. He held office for thirty years, during which 65,000 patients passed through the hospital with an average annual mortality from all causes of only 1·3%. Boer's enemies succeeded in deposing him in 1822 on the pretext of insubordination because he refused to teach midwifery on the female cadaver instead of the leather phantom. His successor Klein discarded the English methods and also taught upon the cadaver: the mortality rose from 1·3 to 7·8% in his first year and remained high, in some months reaching even 29·3%. From 1840 onwards the obstetric work was carried out in two divisions, the first reserved for the instruction of medical students, the second for that of midwives. The students were encouraged to make frequent examinations of the patients before, during and after confinement, and practical instruction was given upon the female cadaver. Moreover, the students often proceeded from the dissecting or the post-mortem room direct to the lying-in room after a very perfunctory washing of their hands. In the



White's chair for the puerperium.

second division the midwives made just as frequent examinations, but their practical instruction was given on the leather phantom instead of the dead body, nor did they attend either dissections or post-mortems. For the six years, 1841 to 1846, the average mortality in the first division was three times, and in 1846 four times that in the second division. This appalling difference excited such notoriety and alarm that many women refused to enter the first division.

THE WORK OF SEMMELWEIS

Ignaz Philipp Semmelweis, who was then assistant to Professor Klein, had charge of the first division and

conducted autopsies on all their fatal cases. In 1847 a colleague of Klein's who had been accidentally pricked while making a medicolegal autopsy died of blood-poisoning, and Semmelweis, who attended the post-mortem upon him, was struck by the identity of the appearances disclosed with those in death from puerperal fever. He thereupon concluded that the latter must be caused by the conveyance of cadaveric material, adhering to the hands of the students, to the lying-in woman during vaginal examination. Consequently, he instructed all students attending the first division to avoid contact with any cadaveric material prior to their daily attendance, to scrub their hands thoroughly with soap and water and to soak them in a solution of chlorine before and after every examination of a patient. This practice resulted in a fall of the death-rate of the first division from 11·4% during 1846 to 1·28% in 1848. Semmelweis then promulgated the doctrine that puerperal fever is caused by the conveyance to the lying-in woman of particles of cadaveric material through the agency of the examining finger. At that date he apparently considered this the only cause and took none of the precautions adopted by British obstetricians since the time of White. In 1847, however, two consecutive outbreaks of puerperal fever were traced to the handling of foul discharges from two patients with a cancer of the cervix and a suppurating knee respectively. Semmelweis thereupon added the doctrine that puerperal fever might be conveyed by putrid particles derived from living persons, either on the examining finger or through air fouled with their emanations. Disgusted with the opposition of his chief, Professor Klein, and others of his colleagues, he left Vienna in 1851 to return to his native city of Buda-Pest, and it was not until 1856, after he had been appointed professor of midwifery there, that he came to appreciate the importance of clean linen and clean dressings. He noticed that the sheets "actually stank" with decomposed blood and lochia. In 1857–58, of 449 confinements 18 died of puerperal fever, and early in 1858 10 died thereof in a single day, although throughout this period chlorine disinfection of the examining hand was scrupulously enforced. Because of these experiences Semmelweis in 1861 added to his previous declarations the statement that puerperal fever may be conveyed to the lying-in woman by foul bed-clothes, dressings and sponges, and by the hands of midwives and nurses. He later stated that a puerperal woman may infect herself owing to the retention within the birth-tract of material which has undergone decomposition, that instrumental injuries of the genital passages may produce puerperal fever by self-infection, that free ventilation of lying-in wards is necessary to carry away exhalations from patients, and that an infected puerpera should be promptly isolated.

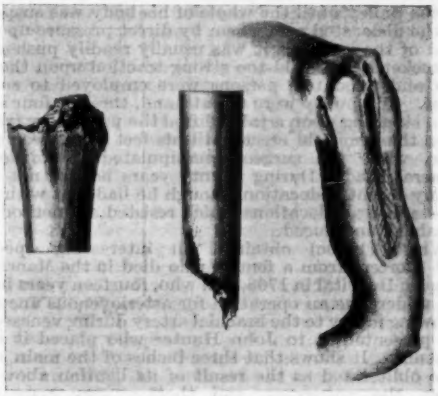
Thus, by successive stages spread over several years Semmelweis at last arrived at the identical views and practice advocated by Charles White over 75 years previously. The only factor not specifically mentioned by White, and to which Semmelweis had some claim to originality, was the fatal rôle played by the examining finger fouled by contact with decomposing cadaveric material. In White's day Manchester had no medical school and, therefore, no medical students to handle and convey cadaveric particles to the lying-in woman. The claim made by continental writers that our knowledge of the prevention and treatment of puerperal sepsis originated with Semmelweis ignores the whole of the pioneer labours of White and of British obstetricians—work carried out long before Semmelweis's birth. All honour to Semmelweis for his courageous advocacy, in face of strong opposition, of measures to diminish the appalling risks of childbirth in his day, but the glory of the pioneer must be awarded to Charles White.

PHLEGMASIA ALBA DOLENS

In 1784 White published "An Inquiry into the nature and cause of that swelling in one or both of the lower extremities which sometimes happens to lying-in women," but gave no title to this condition either then or in a second edition which appeared in 1792. Dr. John Hull (1800) gave to it the name phlegmatia dolens. White, in 1801, enlarged this title into phlegmasia alba dolens puerperarum. He described fully its symptoms, course and treatment, and expressed an original opinion of its pathology, attributing it to an obstruction of the lymphatic trunks where they enter the pelvis under Poupart's ligament. White considered that compression by the fœtal head of some of the main lymphatic trunks led to their rupture as they passed over the pubic portion of the pelvic brim, and that the cicatrisation following healing of the ruptured lymphatics resulted in their obstruction with consequent swelling of the limb below until such time as an effective collateral circulation became established; for this weeks and sometimes months were requisite but, once developed, such a lymphatic by-pass must necessarily prevent a repetition of the trouble in the same limb.

WHITE AS A SURGEON

Not only was White a pioneer in certain aspects of midwifery, but he was also a most original surgeon, and read many papers on surgical topics before the Royal Society. From the historical outlook, the most interesting of these and one for which he has since been referred to frequently but erroneously as the first surgeon to excise the shoulder-joint for disease, concerned a boy of 14, of scrofulous habit, who was admitted to the Manchester Infirmary in 1768 (White 1770a). A fortnight previously he had been seized with acute inflammation in the left shoulder culminating in a large abscess which had been incised on the inner side of the arm shortly before admission. Through this opening the upper end of the humerus was felt to be quite bare and from it escaped a profuse and offensive discharge. Though the usual practice for such a condition at that time was amputation White, eight days after admission, exposed the bared portion of the humerus through an external incision; pushing the elbow strongly upwards, he forced the upper part of the bone completely out of the wound and sawed off two inches with an ordinary amputating saw. The discharge rapidly diminished, swelling of the limb abated, all hectic symptoms subsided. After two months a large sequestrum was removed and the wound healed rapidly, the ultimate result being that, although over four inches of the shaft had been lost either through removal at operation or by subsequent sequestration, yet the arm was but one inch shorter than its fellow, and all movements of the shoulder were completely restored. This result exceeded White's most sanguine expectations; believing, as he did, that he had excised the head of the humerus together with the upper part of the shaft,



White's case of inflammation of the shoulder.

he was astounded at the extent to which the shaft, head, articular cartilage and capsule of the shoulder-joint had apparently regenerated and at the absence of ankylosis after such a severe suppuration. This favourable ending is adequately explained, however, on examination of the plate accompanying White's paper, together with the clinical history. The bone removed at the operation was obviously the pyramidal upper end of the diaphysis, having no sign of the tuberosities upon it. The case, therefore, must have been one of acute osteomyelitis commencing in the upper humeral metaphysis, followed by subperiosteal abscess and later by spontaneous separation at the upper epiphyseal line, the epiphysis

itself remaining in situ. The synovial cavity of the shoulder escaped serious inflammation owing to the extra-articular situation of the epiphyseal line, and so complete restoration of movement of the joint was not only possible but actually occurred. Thus, although White was not the first to excise the head of the humerus for disease yet, quite unwittingly, he really was the pioneer in the operation of partial diaphysectomy for acute osteomyelitis.

In 1762 White published in London a volume on the "topical application of the sponge in hæmorrhage," based on two communications to the Royal Society. The customary method of arresting hæmorrhage was then by the ligature, which, though successful as a primary application in amputations and other wounds, was said to be the most painful part of the operation since some of the soft parts were usually included within the ligature. Moreover, it frequently failed in lacerated and contused parts and in cases of what we now call secondary hæmorrhage, where the suppurating and softened tissues would not again bear ligation. White advocated the application to the bleeding point of a suitably sized piece of compact and thoroughly dried sponge maintained in place by the firm pressure of a bandage, or by strapping. In his communication to the Royal Society 13 cases were recorded where the use of the sponge had successfully arrested hæmorrhage when all other means had failed, and in his book he stated that he used it constantly, even for the larger arteries, without it ever having failed him. In 1770 he published a further series of successful cases (White 1770b), and he then noted that those parts of the wound to which the sponge had been applied were much cleaner than the rest. This led him to use dried sponge as a dressing to foul ulcers and abscesses, and he found that this cleansed them more quickly and effectually than any other method then known. He gradually developed the practice of leaving the sponge dressings undisturbed until they became definitely offensive, sometimes even for 10 to 14 days, and he would thus seem to have anticipated by over a century and a half the principle of the modern Winnett-Orr treatment of acute osteomyelitis.

White devised a method for reduction of dislocations of the humerus. An iron ring was screwed into a beam of the ceiling and one end of a pulley fixed to it, the other being fastened by bandages to the patient's forearm just above the wrist. The patient was then drawn upwards by the pulley until the whole of his body was suspended by the dislocated arm when; by direct pressure upon the head of the humerus it was usually readily pushed into its socket. To avoid too strong traction upon the forearm and wrist two persons were employed to support these. If a pulley were not at hand, three or four strong men, standing upon a table, lifted the patient by traction upon the arm held erect until his feet were clear of the floor, while the surgeon manipulated the dislocated humeral head. During twenty years he had not failed in any recent dislocation, though he had met with three old-standing dislocations which resisted all methods and remained unreduced.

White (1770c) obtained an interesting specimen post mortem from a female who died in the Manchester Lunatic Hospital in 1768, and who, fourteen years before, had undergone an operation for arteriovenous aneurysm following injury to the brachial artery during venesection. He presented it to John Hunter who placed it in his museum. It shows that three inches of the main artery were obliterated as the result of its ligation above and below the aneurysm, and that a very remarkable collateral circulation had developed.

Stone in the bladder was then common in Yorkshire, and White soon acquired a great reputation as a lithotomist. A large vesical calculus was one of the very few specimens saved from the fire which destroyed his museum; it was removed by him by lateral lithotomy. White's surgical contributions generally show a strongly conservative tendency, and he has, indeed, been acclaimed as the "Father of conservative surgery."

A STUDY IN EVOLUTION

Doubtless influenced by his early association with John Hunter he was always interested in natural history; of many papers read to the Manchester Literary and Philosophical Society the most important was a series on "The regular gradation in man and in different animals and vegetables, and from the former to the latter." They were published in book form in 1799. The idea was suggested to him when present at a lecture by John Hunter illustrated by a number of skulls which Hunter placed on the table in a regular series ranging from the human skull, with its varieties in the European, the Asiatic, the American and the African, downwards through that of the monkey and ultimately to the dog "in order to demonstrate the gradation both in the skulls and in the jaws." Stimulated by this lecture White, for some years, spent his scanty leisure in collecting and reflecting upon an enormous number of biological facts to prove the existence of gradation as a general principle running throughout nature. This might suggest that he had some inkling of the hypothesis of evolution, but he disbelieved in any progressive variation in species, considering that all species were unchangeable and retained the features which characterised them at the time of their creation.* He stopped short of the logical conclusion, possibly because of his strong religious convictions.

In the course of these investigations he made measurements of the head and limbs of a large number of negroes among the sailors visiting the port of Liverpool. On this account he has been styled the "father of anthropometry," and this he certainly was so far as concerns living persons. Anthropometry, however, includes measurements upon the skeleton as well as the living, and in this aspect he had been preceded by Camper and others. But he was the first to discover that the forearm of the negro as compared with the upper arm is longer than the forearm of the European, and that of the ape longer than that of the negro.

PROVINCIAL MEDICAL EDUCATION

The first course of public medical lectures in Manchester (and probably in England outside London) was delivered in 1783 at the house of the Manchester Literary and Philosophical Society by Charles White and his son Thomas, and was open to the lay public as well as to medical men. They also started in 1787 at their own house in King Street the first instructional class confined to medical students, with lectures on anatomy and physiology.

Charles White's house in King Street, where classes for medical students were first held in Manchester.

In the early part of the nineteenth century those desirous of obtaining a medical qualification were obliged to attend hospital practice in London in order to become eligible for admission to the examinations for the licentiateship of the Society of Apothecaries or the membership of the Royal College of Surgeons. Only in London, Edinburgh, Glasgow, Aberdeen and Dublin were there any medical schools. In 1814 Joseph Jordan, the "Father of provincial medical education," as he has been justly styled, started a school of anatomy in Bridge Street, Manchester. His lectures quickly became popular and in 1817 were recognised by the Society of Apothecaries as qualifying to sit for their diploma—this being the first recognition of provincial medical instruction by any licensing body in this country. To obtain bodies for dissection was difficult in those days, and like

most teachers of anatomy, Jordan had to rely upon the "resurrectionists"; this becoming known an infuriated mob on one occasion broke all his windows and kept him prisoner in his own premises for several days. Similar scandals in connexion with other anatomical schools, and particularly the notorious murders by Burke and Hare in Edinburgh in 1827–28 and by Bishop and Williams in London in 1831, focused public attention upon the question of medical education. A select committee of the House of Commons was appointed in 1828 to inquire into the provision of bodies for dissection in the schools of anatomy, and the removal of impediments to the cultivation of anatomical science; upon its report was founded the Anatomy Act of 1832, permitting the unclaimed bodies of persons dying in workhouses to be used for dissection.

Jordan's school was closed in 1834, when its students and most of the contents of its museum were transferred to a school in Pine Street opened by Thomas Turner in 1824. This was the first complete school of medicine to be established in the provinces and, in recognition of this, it was granted the Royal patronage. After absorbing two other rival schools, it was incorporated in 1872 with the Owens College. In 1880 the Owens College became the first constituent college of the Victoria University, though the power to grant degrees in medicine and surgery was not obtained until 1883 and then only in the face of strong opposition from the Royal College of Surgeons and generally from the London medical schools.

A not unnatural outcome of the advent of the provincial medical schools was a request that their certificates of attendance should be recognised by the licensing authorities in London and elsewhere. So far as Manchester was concerned the Society of Apothecaries had already recognised the certificates of Jordan's school in 1817, of Turner's school in 1826 and of the Manchester Royal Infirmary in 1834, and so had the Royal College of Physicians. In spite of repeated requests, however, such recognition was refused by the Royal College of Surgeons which in 1821 had issued a regulation requiring all candidates for its diploma to spend at least six months in study and dissections in the medical schools of London or of the universities of Dublin, Edinburgh, Glasgow or Aberdeen. In 1823 another by-law refused recognition of dissections made in the summer months—a blow obviously aimed at the London private anatomical schools where instruction was usually continuous throughout the year so as to minimise the time and expense to the provincial student of the requisite period of study in London. In 1824 a further by-law enacted that "certificates of attendance at lectures in anatomy, physiology, the theory and practice of surgery, and of the performance of dissections be not received by the Court of Examiners except from the appointed professors of anatomy and surgery in the universities of Dublin, Edinburgh, Glasgow and Aberdeen, or from persons teaching in a school acknowledged by the medical establishment of one of the recognised hospitals, or from persons being physicians or surgeons to any of these hospitals: Guy's, St. Thomas's, St. Bartholomew's and the London." Thomas Wakley, founder and editor of THE LANCET, pointed out that the tendency of these two regulations was to direct all the fees which might accrue from the teaching of anatomy in England and Wales into the pockets of the London hospital surgeons: he considered it not a little singular that of the ten members of the court of examiners by whom these by-laws were enacted at least seven were practising London hospital surgeons.

The secretary of the Society of Apothecaries, however, in his evidence before the select committee, stated that "no young men came before the Court of the Society of Apothecaries better qualified in every respect than those who had been entirely educated at Manchester, where excellent lectures on every branch of medicine are given by very competent teachers and the Manchester Infirmary affords, under the physicians belonging to it, most ample opportunities for the acquirement of practical knowledge." Doubtless as a result of this inquiry the Royal College of Surgeons, in August, 1829, issued a regulation allowing certificates of instruction to be accepted "from the several towns in England possessing properly constituted hospitals together with such means and opportunities of teaching anatomy, physiology and surgery by lectures, demonstrations and dissections as shall be approved by the Court of Examiners." The compulsory six months' attendance at one of the London or other recognised schools in Ireland or Scotland was thus finally abolished and the right of the provincial schools to teach anatomy and physiology officially recognised.

The results of the examinations in anatomy at the Royal College of Surgeons for a period of three years closely following upon this new regulation of August, 1829, displayed the provincial schools in a very favourable light as compared with those in London, their failures amounting to only 1·7% of total entries as compared with 7·8% of failures among London students.

The struggle for the full recognition by the Royal College of Surgeons of clinical teaching at provincial hospitals continued. In 1830 the Manchester Infirmary, with 360 beds, applied, with success, for the Royal patronage, and in the hope that this manifestation of Royal approval might influence the Royal College favourably the Manchester Royal Infirmary, as it had now become, on two occasions besought that body to place it upon the same footing with regard to certificates of attendance at clinical teaching as the recognised hospitals in London, Scotland and Ireland—but all in vain. The chief provincial schools then petitioned Parliament, and in 1834 a select committee was appointed at which the opposition of the Royal College was voiced by its president, Mr. G. J. Guthrie, and seven members of its council. Sir Astley Cooper stated that "Country schools were at a loss in teaching principles; at practice they taught a good deal. Students in London acquired a degree of information which was absolutely impossible to acquire from country teachers. He knew members of the Manchester Hospital school and thought that a shorter residence in London would suffice for one who had been through it. . . . He did not believe that anything like perfection could be obtained anywhere but in London or in some very large town as Edinburgh, Dublin, etc." Sir Anthony Carlisle, one of the surgeons at Westminster Hospital (which then possessed only 82 beds) said: "Many of the general practitioners of the country have contributed to the improvement of surgery; as, for example, Mr. White of Manchester and others, but if Mr. White (or the others) had lived in London, I think the collision of metropolitan society would have made each of them greater men than they were—all great men in large states have been resident in the metropolis and, perhaps, have been raised to high eminence by that excitement."

Thomas Wakley, who strongly supported the claim of the provincial hospitals, had already indicated to the select committee on Anatomy of 1828 the absurdity of the position that the Royal College of Surgeons should accept one year's attendance at the Westminster Hospital with only 82 beds and yet required four years at provincial hospitals some of which possessed upwards of 300 beds. He hinted that this might not be altogether unconnected with the fact that two of the four surgeons to the Westminster Hospital were on the court of examiners of the Royal College and all four were on the council by which the examiners are elected.

Evidence favourable to the provincial schools was given by Mr. J. Somerville, inspector under the Anatomy Act, who said "Manchester, Birmingham, Liverpool and Bristol have opportunities of teaching anatomy that are not surpassed in any place or town," and by the secretary to the Society of Apothecaries who expressed the opinion that "Students from the country in general were quite as well instructed as those who study only in the schools of London, and many evinced a very great deal of information indeed." Owing to a change in the Government following closely upon its sittings, the select committee never issued a report but published merely the evidence given before it. The Royal College of Surgeons declined to give way until 1839 when it was finally agreed to accept certificates of attendance on the practice of surgery at any recognised hospital in the United Kingdom. Thus was won the protracted fight for the full recognition of the provincial medical schools.

Looking back upon this rather bitter controversy of just over a century ago one is left with the impression that the members of the College council of that period displayed an undue regard to self-interest, a narrowness of vision and a lack of foresight happily quite foreign to

the council of these days, when the interests of the London and provincial schools are guarded equably and impartially, and where representatives of each meet in the greatest harmony and good fellowship.

That the association of Charles White with John Hunter as fellow-students produced a profound and lasting impression is shown by White's insatiable appetite throughout his long life for work of a practical and experimental nature, in his early start as a collector of specimens and founder of a museum, and by his studies in comparative anatomy, in botany, in fossils and in anthropometry. Like Hunter, he was an eager and serious student of nature in all her protean manifestations. John Hunter's indisputable right to immortal fame rests upon many factors, among others, his unique knowledge of anatomy both human and comparative, his persistent advocacy that "Structure is only the ultimate expression of function" with its consequent linking of anatomy with physiology and of both with pathology and surgery, his emphatic and enthusiastic insistence upon the experimental method of investigation, and, as a crowning glory, the foundation of our superb Hunterian museum, second to none elsewhere. John Hunter loved work for work's sake, and although he acquired a lucrative practice yet money to him was of value only in that it supplied the wherewithal to continue his researches and to augment the priceless treasures of his collection. His museum, said to have cost him £70,000 in addition to 40 years of incessant toil, was his only material possession at death, and, pending its sale to the Government six years later for £15,000, his widow was compelled to accept the King's Bounty. Hunter's life's work calls vividly to mind those lines of Rudyard Kipling:

> "And only the Master shall praise us, and only the Master shall blame;
> And no one shall work for money, and no one shall work for fame,
> But each for the joy of the working, and each, in his separate star,
> Shall draw the Thing as he sees It for the God of Things as They Are!"

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CHEMOTHERAPY OF GAS GANGRENE

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Experimental and clinical studies have shown that the sulphonamide drugs have a bacteriostatic action on the causal organisms of gas gangrene. These studies, at first confined to the effects of oral administration (Domagk 1937, Long and Bliss 1937, Stephenson and Ross 1940, Henderson and Gorer 1940), were extended to the effects of local application of sulphanilamide in infected guineapigs by Legroux (1940) and gave promising results. However, the practical application of these findings to war wounds and air-raid casualties does not appear to have given results such as were to be expected from the preliminary experiments. The experiments to be described were undertaken with the idea of finding how this discrepancy arose, and to probe further the local application of these drugs to wounds.

In the first place, we considered it essential to produce a rapidly fatal intramuscular lesion in mice with *Clostridium welchii*, for this micro-organism is by far the most freqent cause of gas gangrene. Because of the difficulty of reproducing regularly a virulent intramuscular infection with *Cl. welchii*, much of the previous work on the chemotherapy of gas gangrene in mice has been done on *Cl. septique* or on *Cl. welchii* after intraperitoneal or intradermal injection. However, using a virulent strain of *Cl. welchii*, recently isolated from a severe case of gas gangrene, we were able to obtain regularly a mortality of 100% in 24 hours in mice after intramuscular injection along with calcium chloride as recommended by Bullock (Gye) and Cramer (1919). The successful production of this very severe muscular lesion in mice has afforded us a convenient test by which the relative merits of various preventive and therapeutic measures can be readily tested, and has also enabled us to assess the comparative value of three of the sulphonamides against *Cl. welchii*, *Cl. septique* and *Cl. œdematiens*.

MATERIAL AND METHODS

Preparation of bacterial suspensions.—The strains of clostridia employed were: *Cl. welchii* B.S.I. strain 186 from a recent case of gas gangrene, *Cl. septique* B.S.I. strain 84, and *Cl. œdematiens* B.S.I. strain 85. A relatively toxin-free suspension was prepared by centrifuging an 18-hour meat-broth culture and washing twice in saline. The suspension was then diluted to give an opacity which, in the conditions of our experiments, would kill all inoculated mice within 24 hours. The opacities usually required for the three organisms, corresponding to standard opacities for *Bacterium coli*, were roughly: *Cl. welchii* 1000–2000 million; *Cl. septique* 1000–1500 million; *Cl. œdematiens* 100 million per c.cm.

Inoculation of mice.—The control, or untreated, mice were injected in the muscles of the right thigh with 0·2 c.cm. of equal parts of the bacterial suspension and 5% calcium chloride.

Administration of drug.—(*a*) *Local.* For local administration the drug was ground in a mortar and suspended in the infecting inoculum so that the required dose of the drug was contained in 0·2 c.cm. The mice were then injected with 0·2 c.cm. of the suspension in the same manner as the control mice. (*b*) *Oral.* The mice were injected in the same way as the control mice and were immediately given 25 mg. of the drug in a 10% suspension in 50% mucilage through an œsophageal cannula. This dose was repeated at 6, 24, 30 and 48 hours. (*c*) *Local and oral.* This consisted of a combination of the local and oral administrations omitting the oral dose at the time of inoculation.

EXPERIMENTAL

The results of our experiments are shown in tables I–V where the effects of the drugs in delaying death can be estimated from the average number of days survived as given in the last column. This figure is obtained by dividing the total number of whole days survived in each group of mice by the number of mice in the group (Whitby 1937). The mortality for only 3 days is considered, because mice living beyond this interval usually survived the immediate effects of the experimental disease.

TABLE I—EFFECT OF LOCAL SULPHANILAMIDE ON *CL. WELCHII* IN MICE

Inoculum	Sulphanilamide (mg.)	No. of mice	No. of mice dying on day: 1	2	3	Survived three days	Av. no. of days survived
Culture (subcutaneous)	..	20	12	5	2	1	0·6
	20	20	5	2	1	12	2·0
Washed bacterial suspension + calcium chloride (intramuscular)	..	60	60	..	..	0	0
	20	12	8	1	0	3	0·8
	40	48	6	8	1	33	2·3

The experiments of table I show that 20 mg. of sulphanilamide given locally delayed death considerably after subcutaneous injection of cultures of *Cl. welchii*, but we decided that the mortality in the control mice was not high enough for further experiments. We then used a washed suspension of the organisms injected along with

TABLE II—EFFECT OF LOCAL AND ORAL SULPHANILAMIDE ON *CL. WELCHII* IN MICE

Expt.	Sulphanilamide	No. of mice	No. of mice dying on day: 1	2	3	Survived 3 days	Av. no. of days survived
1	None	12	12	..	..	0	0
	Local	12	0	0	0	12	3·0
	Oral	12	4	5	2	1	1·0
	Local + oral	12	2	1	0	9	2·3
2	None	12	12	..	..	0	0
	Local	12	3	2	0	7	1·9
	Oral	12	8	0	0	4	1·0
	Local + oral	12	2	2	0	8	2·2

Infecting inoculum.—0·1 c.cm. washed suspension of 18-hour culture + 0·1 c.cm. 5% calcium chloride; intramuscular.
Sulphanilamide.—Local = 40 mg. suspended in infecting inoculum. Oral = 25 mg. at 0, 6, 24, 30 and 48 hours. Local + oral: 40 mg. local + 25 mg. oral, at 6, 24, 30 and 48 hours.

calcium chloride and the mortality was increased to 100% in 24 hr., but in consequence local sulphanilamide in a dose of 20 mg. appeared much less active. When the local dose was increased to 40 mg. the average time of survival was greatly increased. We therefore decided to use this method of infection and 40 mg. of drug as standards for further experiments.

In table II a comparison is made between the effects of the local administration of 40 mg. of sulphanilamide and the administration of 50 mg. of the drug by mouth within 6 hr. In experiment 1 all mice injected locally with sulphanilamide survived for 3 days, whereas those given sulphanilamide by mouth had an average survival of only 1 day. In experiment 2, where twice the number of organisms was injected, the average survival time after local administration was twice as great as after oral administration. It is also evident that when an adequate amount is given locally there is no great advantage in giving more by mouth.

Fig. 1 and table III give the results of three experiments in which the action of three of the sulphonamides on

TABLE III—COMPARATIVE EFFECT OF THREE SULPHONAMIDE DRUGS ON THREE GAS-GANGRENE ORGANISMS

Organism	Drug	Average number of days survived: Control mice	Local	Oral	Local + oral
Cl. welchii	None	0	..	..	..
	Sulphanilamide	..	1·4	0·2	0·8
	Sulphapyridine	..	2·0	0	1·7
	Sulphathiazole	..	1·6	0·5	1·8
Cl. septique	None	0	..	..	..
	Sulphanilamide	..	0·75	0·7	1·2
	Sulphapyridine	..	0·5	0·3	0·7
	Sulphathiazole	..	2·7	1·25	1·6
Cl. œdematiens	None	0	..	..	..
	Sulphanilamide	..	0·6	0·4	0·75
	Sulphapyridine	..	1·0	0·8	1·1
	Sulphathiazole	..	1·75	0·8	2·3

each of three causal organisms of gas gangrene is compared. As with sulphanilamide against *Cl. welchii* local administration of any of the three sulphonamides in all three infections is more effective than oral treatment and there is no apparent advantage in supplementing local administration by giving more by mouth. All three drugs are of some value in delaying death but sulphapyridine is of slightly greater value than sulphanilamide against *Cl. welchii* and *Cl. œdematiens*, and sulphathiazole is significantly more effective than the other two drugs against *Cl. septique* and *Cl. œdematiens*.

The experiment of table IV shows that if sulphanilamide is injected in the muscles of the left leg at the time of infection in the right leg it is much less effective than if it is given along with the bacterial suspension. In table V it is shown that local sulphanilamide becomes less effective if its administration is delayed.

In the conditions of these experiments, therefore, it may be concluded that the sulphonamide drugs are of considerable value in the treatment of gas gangrene provided they are administered at the site of infection, in large quantities and as soon as possible.

DISCUSSION

There are several favourable reports on the results of local treatment with the sulphonamide drugs in various types of infected wounds (Jensen, Johnsrud and Nelson 1939, Nitti 1939, Key and Burford 1940, Herrell and Brown 1940) and on experimental gas gangrene (Legroux 1940). Following on Legroux's work, local prophylactic measures with these drugs have been used in both the French and British armies with good results though in a certain number of cases gas gangrene did make its appearance in wounds (Handley 1940). Our experimental results show that these drugs have a definite bacteriostatic effect on the organisms of gas gangrene, but that it is much less, both in vitro and in vivo, than that against many aerobic bacteria. For example, one knows that for

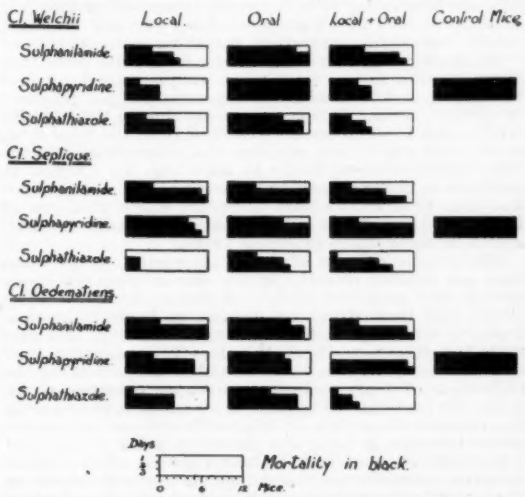

FIG. 1—Comparative effect of three sulphonamide drugs on three gas-gangrene organisms (see table III).

a streptococcal infection one requires a sulphanilamide level in the blood of about 5–10 mg. per 100 c.cm., which is about $3 \cdot 10^{-4}$ *M*, the concentration required for inhibition in vitro (Woods 1940). A much higher concentration of these drugs is required to prevent the development of gas gangrene, and there is no more convenient way of attaining this than by applying the drugs in large doses at the site of injection.

Regarding the choice of the drug to be used as a prophylactic against the development of gas gangrene in wounds our experiments indicate that the three sulphonamides used are of almost equal value against *Cl. welchii*. Since sulphanilamide is the cheapest and the most available of all the sulphonamides we would recommend its use in all such cases both for treatment and prophylaxis. If the presence of another infecting organism is suspected another drug might be tried. We advise that most

TABLE IV—EFFECT OF LOCAL AND REMOTE INTRAMUSCULAR SULPHANILAMIDE ON *CL. WELCHII* IN MICE

Sulphanilamide	No. of mice	No. of mice dying on day: 1	2	3	Survived 3 days	Av. no. of days survived
None ..	12	12	..	..	0	0
Local ..	12	3	4	0	5	1·6
Remote ..	12	9	3	..	0	0·25

Sulphanilamide.—Local = 40 mg. along with infecting inoculum in right leg. Remote = 40 mg. in left leg.

wounds should be packed with at least 10 g. of sulphanilamide, or more if possible. If the dose were to correspond to our findings in mice it would be about 50 g.; such amounts could hardly be applied to most wounds, so the inference is always to put in as much as possible

TABLE V—EFFECT OF DELAYED LOCAL SULPHANILAMIDE ON *CL. WELCHII* IN MICE (DOSE 40 MG.)

Sulphanilamide given after hours:	No. of mice	No. of mice dying on day: 1	2	3	Survived 3 days	Av. no. of days survived
0	6	2	0	0	4	2
1	6	4	0	0	2	1
3	6	5	1	..	0	0·2
6	6	6	..	..	0	0
Controls ..	6	6	..	..	0	0

without interfering with the proper treatment and healing of the wound. Although small doses of a few grammes might have some value they would be inadequate as a local application for most wounds, for results show that these smaller doses, even when supplemented by oral treatment, do not prevent the appearance of gas gangrene in certain cases. This is apparently due to the rapidity with which these drugs are absorbed from the local area, as is borne out by our experimental observations on the elimination of these drugs in mice (fig. 2). Again, in addition to their comparatively weak action on anaerobic bacteria, it is known that there are many products of breaking down tissue which inhibit the bacteriostatic action of these drugs (Fleming 1940).

The greater efficacy of the sulphonamide drugs when they are applied directly at the site of local infections falls in line with the finding of McIntosh and Whitby (1939) that these drugs act directly on bacteria by neutralising some metabolic or enzymic activity, and also with the recent work of Woods (1940) showing that sulphanilamide acts in bacterial cultures by blocking the utilisation of *p*-amino-benzoic acid, an essential metabolite for bacteria. That this mechanism is the same in the therapeutic action of sulphanilamide on a streptococcal infection in mice was shown by Selbie (1940), and it therefore appears that the bacteriostatic effect of these drugs on a sensitive organism depends to a large extent on the concentration of the drug in contact with the infecting organism. This is an additional reason for the direct application of the sulphonamide drugs to the infected area.

Preliminary experiments seem to suggest that antitoxin is less effective than local sulphanilamide in preventing the development of *Cl. welchii* infection in mice injected intramuscularly with calcium chloride as an aggressin when the culture is of high virulence. A dose of 2·5 units, equivalent to 8000 units in man, saves fewer mice than local sulphanliamide. However, small doses of antitoxin prevent the death of mice after the intramuscular injection of cultures of *Cl. welchii* without calcium chloride and where the preformed toxin acts as an aggressin. But in man at the time of wounding the aggressin would not be preformed toxin, it would be derived from the soil, and this would explain many of the failures of antitoxin to prevent the development of gas gangrene. The treatment of an established infection is another problem where antitoxin is of great value in controlling the toxæmia. A potent antibacterial serum, on the other hand, might be a useful adjunct to the sulphonamides in treating the initial infection.

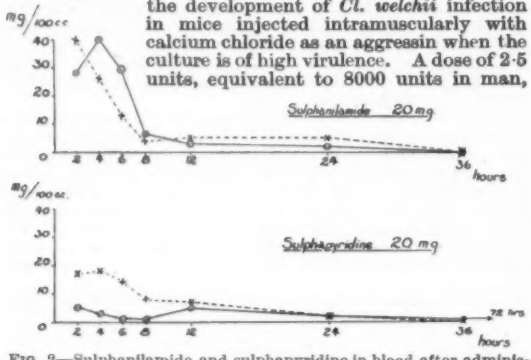

FIG. 2—Sulphanilamide and sulphapyridine in blood after administration by mouth (dotted line) and intramuscularly (continuous line) in mice.

SUMMARY

A study has been made in mice of the prophylactic value of sulphanilamide, sulphapyridine and sulphathiazole against *Cl. welchii*, *Cl. septique* and *Cl. œdematiens*.

The results show that these drugs are of considerable value in preventing the development of gas gangrene provided they are administered locally, in large quantities and soon after the infection. We recommend sulphanilamide as the most suitable prophylactic against anaerobic infections of wounds.

All three drugs were found to have much the same value against *B. welchii* infections, with sulphapyridine slightly the most effective. Against *Cl. septique* and *Cl. œdematiens*, however, sulphathiazole is of significantly greater value than the other two.

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MENINGITIS FOLLOWING SPINAL ANÆSTHESIA

REPORT ON 11 CASES

BY H. J. BARRIE, B.M. Oxfd

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IN July, August and September, 1940, 11 cases of meningitis occurred among the 96 patients who were operated on under spinal anæsthesia in one theatre of the Royal Hospital, Sheffield, during that period. The clinical signs and pathological findings resembled each other. One case was fatal and an autopsy was obtained.

No particular age-group was affected. The operations were with three exceptions clean ones, such as repairs of hernia and fractures. The fatal case was a colostomy for inoperable carcinoma of the colon. The spinal anæsthetics used were from different batches of light Percaine.

Clinical course.—In 9 of the patients there was a rise of temperature to 100° F. or over within the first three days after operation. There were no noticeable symptoms of meningeal irritation at this stage. All of them complained of abrupt onset of severe headache between the 7th and 10th days after operation and in most this was associated with drowsiness, irritability, photophobia, neck rigidity and a positive Kernig's sign. Blood-counts when done showed a polymorphonuclear leucocytosis.

All cases, except the fatal one, were free from temperature and symptoms by the 18th day after operation; 9 when examined four weeks after had no residual signs or symptoms apart from slight lateral nystagmus. In the fatal case the patient became comatose and died within 7 days of the onset of symptoms.

Lumbar puncture was done in 6 cases. The fluid was clear or faintly turbid. The protein averaged 100 mg. per 100 c.cm. with the highest reading 160 mg. and the lowest 60 mg. Chlorides averaged 660 mg. per 100 c.cm.; highest 720 mg., lowest 640 mg. Cells averaged 450 per c.mm.; highest 1100, lowest 9. There was either slight preponderance of lymphocytes or polymorphs and in the average they equalled each other. There was no change in the gold curves except for one mild meningeal reaction. No tubercle bacilli or other organisms seen in films. In 2 cases a second lumbar puncture within two days showed an increase of protein and fall in the number of cells.

AUTOPSY FINDINGS

Female, age 59. Wasted. Recent healing left lower paramedian incision. Patent left iliac colostomy, and 22 cm.

from the anus a carcinoma with fleshy overhanging edges filled the lumen of the gut for 7 cm. Muscularis invaded; infiltrated fibrous adhesions fixing gut to posterior wall of bladder and left adnexæ. Golden yellow cortical adenoma 2·5 cm. in diameter in left adrenal. Chronic venous congestion of small atrophic liver. Very flabby myocardium.

Central nervous system.—Middle ears, bony and venous sinuses clear. Gross flattening of cerebral convolutions. Marked tentorial cone (left 1 cm. wide, right 0·6 cm. wide). Leptomeninges opaque and thickened over basal cysternæ. Both lateral ventricles equally and much dilated, containing faintly turbid fluid; ventricular walls white but patterned with purple dilated veins. Both choroid plexuses bound down by bulky grey semi-translucent sheath of fibrin. Abundant faintly turbid fluid throughout spinal theca, and at its lower end a thin waxy sheet (0·4 × 0·2 cm.) lying free except for few tenuous adhesions.

Microscopically.—The outstanding lesion was a fibrino-purulent lateral ventricle choroiditis. There was slight perivascular cellular infiltration of the ventricular walls, limited to the sub-ependyma. The walls of the third ventricle were involved less. There was an adherent pear-shaped polypus of fibrin plugging the aqueduct of Sylvius. Sections of the frontal cortex showed no neuronal damage, but slight mononuclear infiltration of the subarachnoid space. There were more abundant swollen macrophages and some fibroblastic proliferation in the cysterna magna. The meninges of the cord showed nothing but slight perivenous lymphocytic infiltration suggestive of a subsiding infection. Ziehl-Neelsen and Gram stains did not show any organisms.

Cause of death.—Meningitis and fibrino-purulent ventriculitis following spinal anæsthesia. Acute internal hydrocephalus.

ÆTIOLOGY

Routine bacteriological examinations of samples of cerebrospinal fluid were made throughout the epidemic. No organisms were recovered except in a single case in which three colonies of a small gram-negative bacillus which fermented no sugars were obtained on an inoculated blood-agar plate. At the time this organism was thought to be an accidental contaminant and the cultures were discarded. Towards the end of the epidemic Prof. Wilson Smith of the bacteriological department, Sheffield University, was asked to investigate the condition. His investigations are not yet completed but he has allowed me to quote the following note.

A review of the circumstantial evidence pointed to a cold-water filter as being a possible source of infection. This filter was a Berkefeld multiple candle type and was connected directly to the roof water tanks. The outflow water, assumed to be sterile, was used to rinse the lumbar-puncture needles which were kept in formaldehyde vapour. The candles were frequently disconnected, scrubbed and boiled as otherwise they soon became blocked. Three of the candles had recently been renewed but the other three were old and worn. Water from both inflow and outflow pipes was examined bacteriologically and by animal inoculation with a view to the isolation of a pathogenic virus. No evidence of virus contamination was obtained but a small gram-negative bacillus fermenting none of the usual sugars was isolated from both inflow and outflow water. Attempts to isolate this organism from the cerebrospinal fluid of the only two cases still available were unsuccessful nor could serological evidence be obtained to incriminate it as the cause of the meningitis. Animal inoculation experiments with these samples of cerebrospinal fluid were carried out in the hope of isolating a virus; these also were unsuccessful. It is hoped to publish a full account of this investigation when completed.

In view of these findings the use of the filter was promptly discontinued, after which no further cases of meningitis occurred. Thus although circumstantial evidence strongly suggests the contaminated water as the source of infection direct proof of this has not been obtained.

SUMMARY

In 11 patients out of 96 operated on under spinal anæsthesia in one theatre a low-grade meningitis developed. All except one recovered completely. In the one patient who died autopsy showed a fibrino-purulent ventriculitis. Circumstantial evidence pointed to a bacterial infection due to the use of a defective filter, but this could not be proved.

My thanks are due to Prof. Wilson Smith for his help.

CULTURE OF INTESTINAL PROTOZOA

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ASSISTANT IN THE DEPARTMENT

With the extension of hostilities to the Middle East and the tropics the cultivation of intestinal protozoa has become of interest to a wider circle of workers, and the following notes on culture methods may prove useful.

E. HISTOLYTICA AND *TR. INTESTINALIS*

During the last two years we have experimented with various media for intestinal protozoa, Boeck and Drbohlav's (1925) Dobell and Laidlaw's (1926) medium, bouillonserum media and a semi-solid medium of the following composition:—

Agar (3%)	1 part
Locke (containing 0·1% glucose)	8 parts
Inactivated serum (horse, cow, goat, or human)	1 part

Rice-starch is added, as in Dobell and Laidlaw's medium

The medium is tubed in 5 c.cm. amounts.

The semi-solid medium has several advantages over the usual media for the cultivation of *Entamœba histolytica*. For the initial culture we use either fresh fæces containing amœbæ or cysts concentrated by the method of Yorke and Adams (1926), allowed to stand for half an hour in 5% HCl and subsequently washed by centrifuging in saline. Although growth on the semi-solid medium is slower in the first few days the ultimate culture is much richer, for the amœbæ grow throughout the whole column and are not confined to the bottom of the tube as in the other media. The culture attains its maximum in about 7 days and the life of a culture varies from 10 to 14 days.

Even better results are obtained if this semi-solid medium is inoculated with a culture of *Bacillus prodigiosus*, and a day or two later is inoculated either with washed cysts or amœbæ from fresh stools. Within 24 hours active amœbæ are found throughout the whole column of the medium and within 48 hours the culture is very rich. The average life of a culture is about 7 days, but individual cultures may live up to 17 days. The great advantage of this method is that with repeated subcultures the intestinal flora introduced in the initial culture is to a considerable extent modified, and rich cultures can be inoculated intraperitoneally or subcutaneously into laboratory animals without causing peritonitis or sepsis. *E. histolytica* can be obtained from mixed cultures of *E. histolytica* and *E. coli* by inoculating them subcutaneously into a rabbit; *E. histolytica* is then recovered without *E. coli* by culturing from the infected skin on to semi-solid medium plus *B. prodigiosus*.

A rabbit was inoculated subcutaneously and intraperitoneally with a mixed culture of *E. histolytica* and *E. coli*. Twelve days later a subcutaneous abscess was found round the site of the inoculation. The abscess was opened and pus evacuated. The pus contained no amœbæ. The wall of the abscess was scraped and found to contain active *E. histolytica* which was easily cultured on semi-solid medium + *B. prodigiosus*.

The advantages of working with a culture of *E. histolytica* plus a non-pathogenic bacterium with the object of attempting bacteria-free cultures of *E. histolytica* are obvious.

The semi-solid medium plus *B. prodigiosus* was found very convenient for the cultivation of *Trichomonas intestinalis*. Rich cultures throughout the whole column of the medium are obtained within 24 hours and a culture lives up to 15 days.

CULTIVATION OF *BALANTIDIUM COLI*.

A case of balantidiosis was found in the Mea-Shearim quarter of Jerusalem under circumstances which practically precluded all possibility of contact with pigs. Blood, mucus, pus and *Balantidium coli* were abundant in the stool. Cultures were attempted on Yarbrough's medium, on Boeck and Drbohlav's medium with starch

alone and with starch and diastase or benzpyrene, on the semi-solid medium alone or with diastase or *B. prodigiosus*, or both.

On Barret and Yarbrough's medium (1921) there was survival for 2 days, but no multiplication was observed. On Boeck and Drbohlav's medium with the addition of rice-starch, cultures were obtained but were irregular and subculture was not always successful. The balantidium grew at the bottom of the medium and up to 10 protozoa were found on coverslip preparations. Cultures lived up to 11 days, the average life being 7 days. The addition of a trace of benzpyrene improved the culture; up to 50 protozoa per coverslip preparation were found.

We found the semi-solid medium plus Taka-diastase (1 : 5000 medium) much more satisfactory than Boeck and Drbohlav's medium for the culture of *Balantidium coli*. Coverslip preparations from the bottom of the medium showed up to 250 protozoa per preparation; cultures lived up to 28 days, the average life of a culture being 10 days. The addition of diastase is a great advantage, for it both enriches and prolongs the life of the culture. Without diastase preparations showed only 5 or 6 protozoa per coverslip preparation and the average life of a culture was only 5 days.

By far the best results were obtained with the semi-solid, serum-starch medium inoculated a day or two previously with *B. prodigiosus*. The balantidium grew throughout the whole column of the medium and showed up to 450 protozoa per coverslip preparation. Cultures lived up to 28 days and the average life of a culture was 12 days. The addition of diastase appreciably improves the culture and lengthens its life. Encystment occurs in cultures but conjugation was not found. Maximum multiplication takes place at a pH of 6·7–7·0 and the cultures die out when the pH approaches 5·0. Our strain of *Balantidium coli* was not very sensitive to temperature and grew both at 30° C. and at 37° C., the best cultures being obtained at 30° C.

With all these three protozoa a very small inoculum suffices for producing cultures on the semi-solid medium plus *B. prodigiosus*.

SUMMARY

A simple medium is described suitable for the cultivation of *Entamœba histolytica*, *Trichomonas intestinalis* and *Balantidium coli*.

This work was carried out with a grant from the Dazian Foundation, New York.

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DYSENTERY DUE TO *B. DYSENTERIÆ* NEWCASTLE

PREVALENCE IN EDINBURGH

BY A. J. RHODES, M.B. Edin., M.R.C.P.E.
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THE organism now known as the Newcastle dysentery bacillus was first recognised by Clayton and Warren (1929a, b) in an outbreak of dysentery in Newcastle-on-Tyne. A number of strains of this bacillus have since been extensively studied by Boyd (1936, 1938, 1940), and following his work on antigenic structure it is now generally held to belong to the Flexner group, although admittedly differing in biochemical properties from typical *Bacillus dysenteriæ* Flexner.

Of recent years the Newcastle bacillus has been isolated on various occasions from cases of dysentery in Great Britain—e.g., Scott 1938—and it is the object of this note now to record its present prevalence in Edinburgh. Thus, in 1940, of 187 cases of bacillary dysentery proved in this laboratory by isolation of the causal agent from the fæces, 113 were found to be due to *B. dysenteriæ* Flexner, 47 to *B. dysenteriæ* Newcastle, and only 27 to *B. dysenteriæ* Sonne. It can be seen, therefore, that at the moment the Newcastle bacillus is a common cause of dysenteric infection in this city.

The strains of *B. dysenteriæ* Newcastle isolated in this laboratory have the following characteristic properties. After 24 hours' growth at 37° C. in the usual range of peptone water "sugar" media the only change noted is fermentation of glucose with formation of acid and usually a small bubble of gas at the top of the Durham tube. On further incubation for 3 to 4 days weak acid-production may occur with dulcite, again with a bubble of gas. Certain strains may ferment maltose, with weak acid-production; a bubble of gas is only produced by a few strains; the time taken for this reaction varies from 24 hours to 5 days. All strains are non-motile and do not form indole or ferment lactose, saccharose, or mannite. Final identification of strains having these characters is now rendered straightforward by the use of a specific antiserum prepared by the Oxford Standards Laboratory. An agglutination test is set up with a saline suspension of the organism and varying dilutions of the Newcastle antiserum, incubation being carried out at 55° C. for 4–6 hours. The tests are read after standing at room temperature overnight, well-marked agglutination of the granular type usually taking place to the titre of the serum.

I am informed that, clinically, these cases of infection with *B. dysenteriæ* Newcastle are of the prevalent mild type, and cannot be distinguished from those due to Flexner's or Sonne's bacillus.

I am indebted to Dr. Alexander Joe, medical superintendent of Edinburgh City Fever Hospital, for the clinical information contained in this note.

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Medical Societies

ROYAL SOCIETY OF MEDICINE

AT a meeting of the Section of Otology held on Feb. 7 with Mr. LIONEL COLLEDGE, the president, in the chair, a discussion on the

Psychological Aspects of Deafness

was opened by Prof. HUGO FREY. He said that since a great part of all our sense impressions passed through one hearing organ a study of the psychology of deaf people must be worth while from a theoretical and practical point of view. There was nothing in the literature dealing exclusively with the subject though there were references to aspects of it in the writings of Nager, Eichholz and the Ewings, and of special interest were the confessions of the deaf themselves particularly those of Beethoven and Margaret T. Monro. In dealing with the subject he thought it essential to avoid sentimentality. The deaf were not a uniform group. On the one hand deaf mutes form a separate community among the hearing people; they were almost a separate variety of the species. He asked "What is their conception of the outer world, of an unacoustic, mute world?" Deaf mutes did not usually suffer from mental depression because of their deafness. Psychic abnormalities found in some of them were probably more an outcome of a general degenerative constitution. Therefore even the highest degree of deafness did not in itself necessarily lead to a depressive state of mind. Further, many of those who became deaf in later life—the deafened—still enjoyed life and all it had to offer them. But in this group there were many who suffered from mental depression. This, he thought, was due partly to their difficulties, partly to their exaggerated estimate of the extent of their defect and of its personal and social consequences. Their main complaint was their isolation, the difficulty or impossibility of enjoying company and social life. But it seemed to him that their loss was not really so great. Intellectual life in our time depended much more on the optic sense than on the acoustic. Science, politics, news and even amusement all could be conveyed to us by the written and not the spoken word. The higher the standard of culture the more important because the optic and the less important the acoustic sense. Often their intensively deplored isolation concerned the more trivial affairs of daily existence, the

difficulty of joining in small talk, in short, in banalities. He thought that what the deaf person missed should not therefore produce such an intense feeling of isolation and that there must be other reasons for this. He suggested that in the subconscious mind of every human being was the idea that he had a natural right and an inviolable claim to the integrity of his body and its organs. Anyone who lost this integrity experienced a severe psychic shock, increased by the thought of future progress of the defect, and from this shock there developed a traumatic neurosis. Some of the deafened were able to regain their mental and moral equilibrium unaided but for many psychotherapeutic guidance and influence would be necessary.

Dr. A. B. STOKES said that his interest in the subject was related to a study of deaf people at the Maudsley Hospital and at the psychiatric department of King's College Hospital. He wished to take a wider viewpoint than that of deafness. The psychological associations of any organic disability, considered from the point of view of psychosomatic medicine, raised the question whether such associations were specific for the particular disability. But in the clinical field it was found that whatever the organic disability the psychological response, considered broadly, would take one of few paths, and that these paths remained the same for all organic disabilities and were not specific for any one of them. Thus one might get an anxiety, depressive, hysterical or paranoid response to the onset of blindness, the loss of a leg or to the discovery of a weak heart. Further, the pattern of reaction seen could be traced back in time before the disability was established and recognised as a component of the personality, though operating less overtly when there was no hardship. Thus the underlying factor mainly determining the psychological response was the personality make-up. These organic disabilities produced the same results as other forms of stress, such as the death of a wife, the crash of a business or the failure to achieve marriage, and each had its root in the personality of the individual concerned. But a particular organic disability, considered as a stress, might pick out a type of person to whom it was a special hardship. Out of the total temperamental responses deafness in such a person evoked the response to which he was temperamentally inclined. A depressive state might arise in a person who in earlier life had shown that type of response to situations involving stress. He might show retardation of thought and action, might have self-depreciatory ideas and be filled with gloom about his present, his past and his future. Similarly, according to the individual, hysterical, obsessional or paranoid responses might develop. Yet with all these possible abnormal responses the number of deaf people in a psychiatric clinic was not greater than would be expected from their distribution in the general population. It was people of susceptible personality make-up who broke down under the strain of deafness. When the personality had to adjust to the onset of a stress such as deafness the effect of the speed of onset required consideration. In a general way more acute situations precipitated, in predisposed individuals, an affective response (usually either depression or anxiety) or a hysterical state, whereas a slowly developing deafness enlarged the possiblity of compensation but might bring out, in predisposed people, a paranoid response. Treatment was not approached with pessimism. The lessening of the load by hearing-aids, by lip-reading and by social re-adjustments would allow compensations to develop within the personality. An understanding of the kind of person to be dealt with indicated where the best compensations might be fostered.

Mrs. IRENE EWING dealt in a particular rather than a general way with the psychological effects of deafness. They depended on many active and reactive factors in addition to deafness itself—the health and age of a patient; his environment and previous experience; his social attitude and his disposition towards difficulties; his intelligence and physical and mental readiness or unreadiness to acquire new habits; the nature of his work and interests; his resourcefulness and his sense of humour. On the basis of clinical evidence it could be shown that there were special psychological problems arising from deafness which could be simplified or solved by taking into account the information afforded by the otologist's diagnosis together with the results of pure tone tests of hearing by both air- and bone-conduction, and tests of hearing for speech with the aided and unaided ear. The results of these tests would yield information on two vital points—the extent to which a deaf patient could be enabled to hear speech in his daily life and the extent to which hearing could be helped by lip-reading; and how far a patient was likely to retain or lose normal speech habits. She emphasised that mental and social life was largely conditioned by one's capacity to communicate freely with others. She analysed the case-histories of patients of all types and ages who had attended the clinic for the deaf at Manchester University under four headings:—

(*a*) Did the kind and degree of the patient's deafness influence or hinder his manner of thinking? How far did it set a limit to the range of his thoughts and interests?
(*b*) Capacity to follow the spoken word.
(*c*) Ability to talk intelligibly and audibly.
(*d*) Capacity to earn one's living—an important factor in mental life.

All the available evidence, including her own personal experience, combined to show that the most serious psychological effect of deafness was the extent to which it restricted speech experience. From this limitation arose all the familiar symptoms of unhappy mental life, uncertainty in action and the distrust of self often seen in deaf patients.

Reviews of Books

The Orientation of Animals

By G. S. FRAENKEL, lecturer in physiology in the department of zoology and applied entomology, Imperial College of Science and Technology, London; and D. L. GUNN, lecturer in zoology, University of Birmingham. London: Humphrey Milford, Oxford University Press. Pp. 352. 21*s*.

THIS is an engaging book which could be described in half a dozen ways, so truly have the authors transcribed their knowledge, their love of law and order, their philosophical beliefs and their enthusiasm. Orientation is not used in the restricted sense which the purely "human physiologist" tends to take for granted; the book is about the reactions of animals, chiefly invertebrates, to influences like light, temperature and humidity. Equilibrium of mammals in relation to gravity gets short shrift, and the reader will gain more information on this subject from other sources.[1] From Fraenkel and Gunn, however, he will learn almost everything else about orientation, and when he is not engrossed in such problems as what guides the bed-bug, or how the ant finds his way home, he will find himself wanting to argue with the authors about free will or about the degree of probability that a certain type of flatworm would migrate from light to darkness if it had ideal properties. Terminology is their first preoccupation, and in classifying the types of reaction whereby animals become oriented (or orientated, as they inexplicably prefer to say) with reference to a stimulus, they adhere to terms which have the maximum of objectivity and imply the minimum of anthropomorphism; indeed, they are, if anything, at too great pains not to be misunderstood. The second part of the book is more detailed and deals with the conditioning stimulus—its type, its possible modes of action, and its manipulation so as to yield the information required. All kinds of experiments are discussed, with a wealth of example and illustration, and a bibliography, which make the book valuable for reference.

The World and the Atom

By C. MØLLER and EBBE RASMUSSEN. London: George Allen and Unwin. Pp. 199. 10*s*. 6*d*.

THE world of Møller and Rasmussen is not the world about us but the world of the atom itself. They have succeeded, not so much in giving us a picture of atoms as they exist, as in gradually unfolding the discoveries that have led to the prevalent ideas of the sort of processes going on inside atoms. The discovery of the electron opened the epoch of research into the way of an atom, and it is common knowledge that this discovery

1. See Ellis, M. *Lancet*, 1940, **2**, 371.

was made by the late Sir Joseph Thomson. There is a bad blemish in the book where we read, on p. 36, "By means of such experiments, which we owe especially to J. J. Thomson of England, the velocity of the (cathode) rays was now successfully calculated." This is followed on p. 37 by ". . . we may indeed assume . . . that electricity consists of infinitesimal particles. For this assumption . . . proof was adduced by means of a great experiment in which Millikan of America succeeded in directly measuring the quantity of electricity pertaining to an individual electron." This is a complete travesty of the real position. The foreword is by Prof. Niels Bohr. The book is almost devoid of mathematics and is written in conversational style; the authors remind us that spectroscopists, in the not very distant past, were regarded as "not far removed from cranks," but nowadays they are allowed into the society of the elect; in fact, whenever a new particle is discovered, the first question is "What *will* the spectroscopist say about it?" The new physical discoveries about the atom have given the spectroscopist something to bite on, something much more tractable—or malleable—than the old, hard, elastic spheres of Kelvin-side. In the last chapter a reasoned answer is given to the popular inquiry about releasing appreciable energy from excited, radioactive or bombarded atoms—apparently there is no hope.

Fractures

By GEORGE PERKINS, Ch.M. Oxfd, F.R.C.S., assistant orthopædic surgeon to St. Thomas's Hospital. London: Humphrey Milford, Oxford University Press. Pp. 381. 20*s*.

THE author has compressed much into this small volume. He writes clearly and concisely, but the short abrupt sentences may sometimes read more dogmatically than he intended. His advice, allowing for the personal bias—which is as much a quality as a defect in surgeons—is sound and conservative; he always advocates the little less rather than the little more in treatment. Several points about the book invite criticism, however. One is the odd arrangement by which—to bring the diagrams opposite the relevant text—whole pages are left blank except for a line or two. More serious objection can be taken to the section on skull fractures which is so sketchy as to be in places misleading, and the section on jaw fractures will seem altogether too lighthearted in tone to those who have treated such cases; the diagram of the four-tailed bandage contains its own condemnation. The long bones are dealt with well, and the diagrams, though sometimes rough, generally make their point in a telling manner.

Textbook of Medicine

(5th ed.) Edited by J. J. CONYBEARE, M.C., D.M. Oxfd, F.R.C.P., physician to Guy's Hospital, London. Edinburgh: E. and S. Livingstone. Pp. 1131. 24*s*.

THERE are few changes in this edition. Dr. Maurice Campbell has succeeded Dr. W. H. Craib as part author of the cardiovascular section, which has been worked over afresh. The sulphonamide drugs have, naturally, introduced themselves at many points. Blood-transfusion, as a topical subject, has been presented anew, concisely and effectively, by Dr. F. A. Knott. The sections on hæmatemesis, diverticulitis, and anorexia nervosa are rewritten; in the first of these Dr. Conybeare makes due mention of Meulengracht but still prefers, himself, to give his morphinised patients nothing but sips of water and scraps of ice for 48 hours after they have vomited blood.

The book remains one of the best medium-sized textbooks for the junior student.

Principles of Hematology

(2nd ed.) By RUSSELL L. HADEN, M.D. London: Henry Kimpton. Pp. 362. 21*s*.

THIS American textbook presents the old facts in a new guise and the new facts simply and with understanding. It caters for students rather than for the specialist, but the novel and effective diagrams, charts and microphotographs compel attention and make important points arresting. Like many good teachers, Dr. Haden invites the charge of over-simplification of his subject but he disarms the omission-hunter by admitting that difficult technical methods are not included. It is probably wise to limit the number of leukæmias the student should try to remember, but is there anything to be gained by keeping him in the dark about the value of sternal puncture in diagnosis? We remember facts better than theories, but until it has been conclusively shown that vitamin K is converted in the liver into prothrombin it is best to keep it among the theories and risk forgetting what may have to be forgotten in any case. Throughout emphasis is placed on the technique of examination, and the reader is constantly reminded that clinical interpretation requires accurate laboratory data and that both must be carefully weighed before diagnosis is made. Case-records of more than 100 patients suffering from the various blood dyscrasias are divided into groups so that the differential diagnosis of splenomegaly, for example, may be readily made. The repetition necessary to this method detracts a little from its decisiveness but it will teach the student what to expect and to look for in the wards. The sections which deal with treatment are among the best.

Hæmorrhoids and their Treatment

The Varicose Syndrome of the Rectum. By KASPER BLOND, M.D. Vienna, formerly first assistant, Rothschild Hospital, Vienna; hon. consulting surgeon, Municipal Hospital, Vienna. Bristol: John Wright and Sons. Pp. 140. 15*s*.

THIS book deals with the injection treatment of hæmorrhoids, fissure and fistula. It advocates ambulatory treatment for these conditions and states that the operation for hæmorrhoids, for example, is not only non-radical but is often followed by complications. The author's complete disregard for modern advances in our knowledge of the surgical anatomy and surgical operations for hæmorrhoids, fissure and fistula is owing to his conception of a varicose syndrome of the rectum, upon which he bases the ætiology of all these conditions. The translator, Mr. E. Stanley Lee, F.R.C.S., in his preface, hopes that the theory put forward will arouse controversy; and well it may, since it cuts across all the established principles of proctology.

Rectal Surgery

By W. E. MILES, F.R.C.S., F.R.C.S.I., F.A.C.S., senior surgeon to the Gordon Hospital for Cancer, and consulting surgeon to the Royal Cancer Hospital. London: Cassell and Co. Pp. 359. 17*s*. 6*d*.

THIS book is an interesting and clear record of the life experience of an eminent specialist in rectal surgery. Naturally on many points he expresses personal opinions, and some of these may not be acceptable to all. The matter is well presented, and the illustrations and diagrams are particularly good.

Cushny's Pharmacology and Therapeutics

(12th ed.) Revised by G. W. EDMUNDS, M.D., and J. A. GUNN, M.D., D.Sc., F.R.C.P. London: J. and A. Churchill. Pp. 852. 30*s*.

THE decision in many medical schools to dissociate the teaching of pure pharmacology from therapeutics is important, and its repercussions are apparent in the type of textbook now appearing. "Cushny" represents the old school. Although an experimental pharmacologist, the author was fully alive to the importance of correlating his subject with its therapeutic application, and a substantial proportion of his book deals with medical treatment. In the new edition—longer by some 40 pages, and containing a new section on sulphanilamide, and amplified chapters on the vitamins and internal secretions—the editors have worthily upheld the traditions of the work. It remains one of the best accounts of the subject in the English language. Against this type of book it is often said that the arrangement of the material is dull and out of touch with the realities of clinical experience. No doubt there is some truth in this, but the drawback is inherent in the subject itself—the discovery of a simple and rational classification of the materia medica has defeated some of our ablest intellects. Nevertheless, where angels fear to tread there has been not a little coming and going; the student is overwhelmed with the choice of textbooks, and many of the authors purport to have found a royal road to success in this line of study. It is natural that the deficiencies of these manuals should only become apparent when the student is able to look back.

THE LANCET

LONDON: SATURDAY, FEBRUARY 22, 1941

THE HERITABLE FACTOR IN EPILEPSY

THE last 25 years have seen the steady growth of "symptomatic" epilepsy at the expense of the "idiopathic" group, until in certain circles, especially in France, the existence of the latter has been denied altogether. Most clinicians would, however, recognise that in the majority of cases there is an interplay of an inherited factor with some local want of development, trauma or disease in the brain. The assessment of the heritable factor has long been the subject of controversy, but startling light has been thrown on it by LENNOX, GIBBS AND GIBBS.[1] They find that the incidence of epilepsy among the near relatives (parents, siblings and children) of 2130 epileptics is 2·4%, or about five times that in the general population. Clinical evidence of this sort is likely to be incomplete and some of the findings are open to question. Are fainting fits or an occasional convulsion in infancy, for instance, to be called epilepsy? More valuable as evidence in the clinical field of the heritable factor is the observation that if one of identical twins has epilepsy, in 70% of cases the other twin will be similarly affected.

The establishment of objective laboratory evidence of epilepsy, or of a predisposition to epilepsy, in the near relatives of epileptics would obviously be of first-class importance. Such objective laboratory evidence is, according to LENNOX and his colleagues, provided by the electroencephalograph. Electroencephalograms vary, they admit, with the age of the patient, with attention, wakefulness and cerebral activity generally, and with pulmonary ventilation; but taken under standard conditions in the same patient they are constant and show individuality, though not indeed of the fingerprint standard. Electroencephalograms of identical twins, they note, are always similar whether the tracings are normal or abnormal; and if they are abnormal, the same type of dysrhythmia is always present, even when trauma or other factor has induced what is on the face of it a symptomatic epilepsy in one of the twins. They have investigated by electroencephalography 183 near relatives of 94 epileptics, in most of whom the disease started in early life and—rather surprisingly—only 2 of whom showed normal encephalograms themselves. The relatives included 143 parents, 36 siblings and 4 children, and their ages ranged from 3 to 78 years. As a control group, 100 people were similarly investigated whose families were believed to be free from epilepsy. In every case records were made from six areas of the cortex for at least twenty minutes, and the dominant frequency, constancy and voltage of the waves were the factors considered in deciding whether the tracings should be classed as normal or abnormal. Towards the end of each record there was a short period of voluntary pulmonary overventilation, but records made during this period were not classified as abnormal unless they showed the typical "wave and spike" formation of petit mal. To obtain reliable records, free from artefacts, involves a high degree of laboratory technique, and their classification needs considerable experience. Skilled as they are, the authors had to relegate about 7% of their records to a "doubtful" class.

The results of the investigation are remarkable—60% of the relatives show abnormal tracings (2·2% of them had clinical epilepsy) as against only 10% of the control group. The age of the relatives appears to have little influence on the incidence of dysrhythmia, nor does the age of onset of the disease in the epileptics themselves. Dysrhythmia is as frequent among the relatives of those suffering from symptomatic epilepsy as of those classified as idiopathic. The authors believe that symptomatic cases whose epilepsy begins in early life have, clinically, three times as many epileptic relatives as people in the general population, and idiopathic cases five times as many. Sufferers from symptomatic epilepsy starting in later life, however, have not an unusual number of epileptic relatives. Dysrhythmia is rather more frequent among the relatives of female than of male patients, and among the female relatives than the male. The heritable factor, therefore, is rather stronger in the female. But it does not seem to preponderate among relatives of the same sex as the patient; in other words, there is no sex-linkage. In 55 out of the 94 cases both parents were tested. In only 5% of these were the tracings from both parents normal and in no less than 35% both were abnormal. The experience with identical twins suggested that there might be familial types of dysrhythmia, but the evidence of this is inconclusive, complicated as it must be by mixed inheritance and by the tendency of petit mal to disappear in adult life. Nor is it possible to say whether inheritance varies with the degree of abnormality.

What does dysrhythmia mean for the individual who is unfortunate enough to possess it? Undoubtedly it may mean potential epilepsy, and possibly behaviour disorders, migraine or even psychosis, and in younger patients these possibilities are much nearer probabilities and may even call for prophylactic medication. In older patients who show no other sign of abnormality, fits are unlikely to develop unless they get an added cerebral lesion. These findings, if they are confirmed and accepted, open up far-reaching implications: 2·4% of the near relatives of epileptics have epilepsy, 60% (or twenty-five times as many) have dysrhythmia; therefore, if 0·5% of the population has epilepsy about 12·5% have dysrhythmia—a figure which corresponds fairly to the 10% found in the control group. This gives about a 1 in 100 chance of two dysrhythmics mating; yet no less than 35% of the epileptics in the present series had two dysrhythmic parents—a fact suggesting, perhaps, mutual attraction of similar types of personality. It looks as if a dysrhythmic (a potential epileptic or carrier of epilepsy) should ask for electroencephalographic tracings of his betrothed when contemplating marriage. Here is a new and not altogether agreeable field for the family medical adviser, who would also have the uncongenial task of telling the parents of an epileptic child which of them was responsible for his disease, and which of his brothers and sisters were potential epileptics or

1. Lennox, W. G., Gibbs, E. L. and Gibbs, F. A. *Arch. Neurol. Psychiat.* 1940, **44**, 1155.

carriers of epilepsy on to the next generation. Perhaps it is just as well that electroencephalographic investigations are not as simple as Wassermann tests, but require an expensive apparatus, highly perfected laboratory technique and long experience. For the eugenist a fascinating field opens up. Epilepsy is usually regarded as a Mendelian recessive trait, but this widespread dysrhythmia looks more like a dominant. To breed epilepsy out by sterilisation or segregation of its victims has long been a eugenic day-dream, but if all dysrhythmics are potential carriers we should need a whole battery of machines to sort out the four million miscreants in our own country. We must await confirmation by independent observers of the findings in this paper, and the criticism of other workers in the same field. For the clinician, meanwhile, the heritable factor in epilepsy has achieved a new importance, and those who spoke slightingly of the idiopathic disease have been confounded.

INFANCY OF THE BLOOD-CELL

FEW subjects have been more debated among anatomists than the development of the blood-cells, and since many diseases of the blood are disturbances of maturation of the blood-cells pathologists are also immediately concerned. Much of the controversy has undoubtedly been due to the fact that the results obtained from the study of birds and small mammals are not applicable in detail to man. GILMOUR[1] has now been able to examine a group of human embryos from early presomite stages (from Professor Frazer's collection) up to full maturity. He finds that in the very early embryos blood islands form in the yolk sac, and from their walls the first hæmocytoblasts (primitive blood-cells capable of differentiating into any of the recognised types) arise; at first they develop into erythroblasts—called "primitive megaloblasts"—and some histiocytes; some of these primitive megaloblasts escape into the connective tissue and there proliferate, such foci of erythropoiesis remaining present until quite late stages. In the 3–9 mm. embryos, after the circulation is established, the cells in the blood-vessels are mostly primitive megaloblasts that appear to be hæmoglobinated. After the 10 mm. (six week) stage hæmocytoblasts appear in the liver and from them cells are developed that differ from the primitive megaloblasts in size and structural details and are called "definitive." The earlier basophilic cells of this definitive group are called "primary erythroblasts" and they ripen into "normoblasts" whose nucleus is pyknotic and whose cytoplasm contains eosinophilic hæmoglobin; sometimes, however, these primary erythroblasts develop eosinophilic cytoplasm before the nucleus becomes pyknotic, and then the resulting cells are again called megaloblasts, but "definitive megaloblasts" this time. At this stage also, megakaryocytes appear in the liver. Between the 10 and 26 mm. (eight week) stages the formation of granular leucocytes begins in the liver and in various connective tissues, lymphocytes appear in the blood, and nucleated red cells in the blood fall to about 25%, some primitive megaloblasts being still present. In the next four weeks considerable changes occur; hæmopoiesis begins in the bone-marrow—first in the clavicle—and all types of blood-cells, including megakaryocytes are found there; granular leucocytes appear in the blood and the nucleated red cells fall still further to 5% (all definitive megaloblasts and primary erythroblasts); lymphocytes are forming in the lymph-glands. No very active hæmopoiesis was, however, found in the spleen or kidney at this period. At the 200 mm. (twenty-three week) stage hæmopoiesis in the liver reaches its peak and thereafter decreases. From this stage hæmopoiesis becomes steadily more adult; erythroblast formation in the general connective tissue has ceased, active marrow is present in long and flat bones, the malpighian bodies in the spleen are forming lymphocytes, and nucleated red cells in the blood are less than 1%. Sometimes slight hæmopoiesis is still present in the liver at birth.

In general outline this detailed account agrees with most previous accounts based on the view that the blood-cells are derived from a hæmocytoblast that is not identical with the lymphocyte. GILMOUR finds that, after the 48 mm. stage, erythropoiesis and leucopoiesis are exclusively extravascular, thus differing from DOAN and co-workers[2] who thought the former was intravascular. The part of GILMOUR'S scheme that is likely to meet most criticism is his conception of erythropoiesis. NAEGELI, FERRATA, and DOWNEY have been the main supporters of the view that the megaloblast is the erythroblast of the early human embryo, up to the 10 mm. stage, and that the normoblasts are the definitive series which replaces them after this stage. These megaloblasts are similar to the cells which appear in the bone-marrow in untreated pernicious anæmia; they are derived from the same basophilic precursor that gives rise to the normoblasts (or primary erythroblasts). Both normoblasts and megaloblasts mature by becoming hæmoglobinated, and eventually losing their nuclei. Normoblasts do not change into megaloblasts, or vice versa. This type of scheme has received considerable support from pathological workers since it has enabled them to construct a workable theory of the ætiology of the anæmias. GILMOUR'S "primitive megaloblasts" seem to correspond to the megaloblasts as understood by most hæmatologists; in addition there is his "definitive" group of megaloblasts that are developed from primary erythroblasts and represented as being capable of maturing into megalocytes or—via a pyknotic normoblast stage—into normocytes. Between the 48 and 180 mm. stages this process of development of normoblasts by shrinkage of definitive megaloblasts is important; he terms it "megalo-normoblastic erythropoiesis."

Superficially then it looks as if GILMOUR differs from all present-day workers, with the exception of LAMBIN and DE WEERDT,[3] in not regarding the megaloblast and normoblast series of cells as distinct; but in reality the only difference is that his definitive megaloblasts do not appear in previous schemes. Since these cells are only indirectly related to the primitive megaloblasts it is a pity that some other name was not given to them. For this conception of megalo-normoblastic erythropoiesis is likely to cause unnecessary confusion at a time when the confusion in nomenclature caused by the use of the name megaloblast for the basophilic early erythroblasts has at last

1. Gilmour, J. R. *J. Path. Bact.* January, 1941, p. 25.

2. Doan, C. A., Cunningham, R. S. and Sabin, F. R. *Contr. Embryol. Carneg. Inst.* 1925, **16**, 163.

3. Lambin, P. and de Weerdt, W. *Rev. belge. Sci. méd.* 1938, **10**, 282.

been overcome—although some British and American textbooks still retain quite out-of-date descriptions of the development of the red blood-cells. The material on which GILMOUR'S ideas are based is essentially similar to that studied by his predecessors, so that it is unlikely that hæmatologists, particularly those interested in pathology, will, without stronger evidence, be induced to abandon the simpler schemes of erythrocyte development now current; they will no doubt prefer to wait for further elucidation of the definitive megaloblast.

A LIPOID DISORDER

IN England the name gargoylism has been associated for some years with a polydystrophy first described in 1919 by GERTRUD HURLER, and known on the continent as Hurler's syndrome. Children affected are usually mentally defective and have congenital bony deformities, large livers and spleens, strangely ugly faces and clouding of the cornea. There is, however, as we have previously noted,[1] a forme fruste in which mental defect may be slight or absent and the cornea may be unaffected. Few of the typical cases survive into adult life; their mental powers develop slowly for a few years, then gradually deteriorate, and death before the age of ten years is common, usually from intercurrent infection. Growth is normal for the first year and then slows up, so that all who survive infancy are dwarfed. The head of an affected child is large and his face flat; the bridge of his nose is depressed, profuse nasal discharge usually accompanying the deformity, and the front of the jaw is straight instead of curved, with the teeth set along it at intervals like palings in a fence. Commonly he cannot open his mouth more than a degree or two owing to partial fixation of the maxillary joint. His lips are thick and his full cheeks sag a little, producing a deep nasolabial fold. His eyes, usually large, have a steamy or ground-glass appearance of the cornea, and his broad eyebrows of coarse sparse hairs give his face an odd look of character. His ears are big and set low. His abdomen is large and umbilical hernia is common. He has rather short arms with the elbow-joints fixed in semiflexion; the mobility of his leg joints is also impaired so that his gait is crouching, clumsy and ungainly. Owing to dysplasia of the upper lumbar vertebræ there is usually dorsolumbar kyphosis; the rib margins are flared and the child may be pigeon-chested. The liver and spleen are usually easily palpable. Radiography often shows a long shallow sella turcica, broadening of the ribs and wedge-shaped flattening of the upper lumbar vertebræ, some of which bear an anterior hook-like process. The limb bones are also thickened and bossed, especially near the joints, owing to irregular epiphyseal ossification. So-called stigmata of degeneration, such as hypertrichosis and congenital heart defects, may be present; club foot and cervical rib have each been recorded once. Sexual development is likely to be delayed in those who survive puberty. In disposition these children are grave and gentle, lacking the gaiety often seen in the mongol and the microcephalic. Those showing the complete syndrome seldom learn to speak more than a few words, but they may acquire sphincter control for a time.

1. *Lancet*, 1936, **2**, 1223.

The condition is rare, although 6 new cases have lately been reported, 5 by HENDERSON[2] and 1 by ELLIS.[3] HENDERSON has found 48 authentic cases reported besides his own; 9 others were inadequately authenticated. Two or three children showing the syndrome may be born in one family, often interspersed between normal brothers and sisters. Twins have twice been affected, in one instance both children and in the other one of the pair showing the syndrome. Boys are slightly, but not significantly, more often affected than girls. In 5 cases the parents have been consanguineous, and the available evidence suggests that the condition is recessively inherited.

Only a few cases have been investigated fully post mortem, but the striking pathological finding is a deposition of lipoid, variably distributed. The lipoid is both intracellular and extracellular, and the intracellular deposits resemble the lipoid found in the juvenile form of amaurotic family idiocy. In the brains of 4 of his cases HENDERSON found the deposits to be extracellular and chiefly perivascular. Lipoid deposits have also been found in the anterior lobe of the pituitary, the liver, spleen, myocardium, lungs, thymus, testis and cornea, though these sites are not constant. The central nervous system shows degenerative changes in nerve-cells, particularly those of the basal ganglia and brain stem and the deeper layers of the cortex; the optic thalamus and hypothalamus may show gliosis. HENDERSON considers that the condition, like amaurotic family idiocy, is likely to prove to be a disorder of lipoid metabolism. He favours the name gargoylism, which was first used by ELLIS, SHELDON and CAPON in 1936,[4] but there are substantial objections to it. A minor one is its inaccuracy, a gargoyle, of course, being a spout which may or may not be decorated with a face, but which is in any case prominent and projecting. These children are exceptionally flat in the face; if we must be architectural they resemble some of the heads used to decorate corbels rather than gargoyles. A more serious objection is the offence which the name gives to the parents of these children, and, where intelligence is normal, to the children themselves. Rightly or wrongly we associate the word gargoyle with gross and grotesque ugliness. Those who have interviewed parents of such children know how wounding the name has proved. It should be replaced by some neutral and scientific designation: Hurler's lipoidosis might be appropriate. This would make a second disease named after a woman discoverer, the other being Klumpke's paralysis.

2. Henderson, J. L. *Arch. Dis. Childh.* 1940, **15**, 201.
3. Ellis, R. B. W. *Ibid*, 1940, **15**, 215.
4. Ellis, Sheldon, W. and Capon, N. B. *Quart. J. Med.* 1936, **29**, 119.

IN a short review of war psychiatry, reprinted from the *Surgeons' Hall Journal* (Oct.–Dec. Term 1940), Dr. H. Stalker aims at giving the physician without expert knowledge an idea of the special problems of war-time. Using psychiatric literature of the last war and other more recent publications, and illustrating some points with a few observations of his own, he gives the main facts and touches all important questions. His views are sound and well founded. It would, however, be regrettable if the responsible authorities concluded from the smooth and pleasant reading this paper makes that everything practicable is being done, and that psychiatry is being used to the best advantage in the disposal of man power.

Annotations

COW'S MILK FOR NEONATAL HÆMORRHAGE

WORK on vitamin K in relation to the hæmorrhagic disease of the newborn has not yet cleared up the whole story of the pathogenesis of this condition. Salomonsen of Oslo, who has already shown that the administration of small quantities of cow's milk to newborn infants during the first four days of life can almost completely prevent the hypoprothrombinæmia and prolonged coagulation-time of that period, now reports [1] that this prophylactic method is more effective in summer than in winter; when, in fact, the physiological prolongation of coagulation-time is greater than in the warmer months. It is suggested that cow's milk produces its effect by inducing the growth of bacterial flora in the intestinal tract, thus stimulating the endogenous production of vitamin K, but Salomonsen does not explain how this is achieved, and indeed the details given in his latest paper make the whole subject more baffling than before. He found that when cow's milk additions were made to the diet for the first four days of life there were certain practical difficulties when breast-feeding was successfully instituted. In his most recent investigations, therefore, he has limited the administration of cow's milk to the first two days. On the first day he gave 20 grammes of equal parts of milk and water on three occasions and on the second day 40 g. of the same milk mixture three times. He added 5% of sugar to the diluted milk, and—most important—the milk was raised to boiling point for two minutes in a water bath. Investigations of the coagulation-time in a group of babies receiving cow's milk in this way shows an almost immediate effect compared with a control group fed exclusively on mother's milk. The sharp rise in coagulation-time on the third and fourth days of life found in the control group did not occur in the group receiving cow's milk, and not until the eighth day did the values for the coagulation-time in the two groups coincide. Spontaneous hæmorrhage occurred in 2 out of 10 infants of the control group—surely a surprisingly high proportion—and in none of the babies receiving cow's milk. These results were obtained in the winter and were not so spectacular as in the previous summer investigations since normal levels for coagulation-time were not obtained. Nevertheless it was sufficiently reduced to prevent the occurrence of spontaneous hæmorrhages and the method was therefore adopted as a routine in the obstetrical department of Rikshospitalet in Oslo. Over a period of six months, beginning in November, there was no case of hæmorrhagic disease in the newborn among 1005 live births, while in the same six months in the previous five years there had been 40 cases in a total of 4783 live births. The results seem clear but the explanation is obscure. Boiled cow's milk appears to produce effects in the newborn baby's intestine which human milk cannot achieve. It can scarcely be the direct introduction of living bacteria, and, if the seasonal variation now discovered by Salomonsen is considered, even dead bacteria are unlikely to be the explanation. Does vitamin K or its precursor come into the story? Is this present in cow's milk and is there a seasonal variation in the quantity? Views on the boiling of cow's milk are unfortunately not so satisfactory in this country as in Scandinavia and it might prove dangerous to encourage the administration of cow's milk to infants in the early days of life here. Until we know more it seems wiser to continue to treat the hæmorrhagic disease by injections of adult blood, promptly, on the earliest manifestation of the disorder. Possibly there is a case for giving vitamin K to all mothers just before delivery as a prophylactic measure; this would be safer, on the whole, than giving of cow's milk to the baby. But the method successfully adopted at the Rikshospital raises many points whose investigation may throw light on the still obscure pathogenesis of the hæmorrhagic disease of the newborn.

1. Salomonsen, L. *Acta pædiatr., Stockh.* 1940, **28**, 1.

THE FIRST PERMANENT MOLAR

DENTAL surgeons have lately been discussing the merits and demerits of extracting the first permanent molars as soon as they appear. A. A. Wilkinson claims [1] that in 99% of mouths there is insufficient room for the teeth and that dental irregularities and the impaction of third molars are the result; if the first permanent molars are extracted as a routine, the evils of overcrowding disappear in every case; teeth drift into good alignment, the dental arches widen, caries is reduced and in 60–70% of cases entirely prevented; and, judging by observations continued over 25 years, pyorrhœa does not develop in later life. He advocates removal before the roots of the second permanent molars are more than half developed, the best age usually being between 8 and 10½ years. His illustrative cases all have satisfactory dentitions, but he publishes no models of the original conditions for comparison. He is so emphatic that he should have presented more detailed evidence, in order to allay criticism. Conclusions from independent workers would be valuable, but it is doubtful whether others are working along the same lines. Statistics of the incidence of caries after the extractions would be specially useful, for though it is reasonable to suppose that interstitial caries might be reduced it is hard to see why there should be a reduction in occlusal caries. It is widely agreed that these four molars ought to be extracted in some cases, but it seems a doubtful claim that every mouth would benefit. Where the deciduous molars have been removed early, and the drifting of the remaining teeth has encroached on the space for the future premolars, it may be necessary to remove the four molars in order to prevent irregularities. Similarly their extraction may prevent crowding where the jaws are unusually small. The irregularities arising from these two causes, however, are seldom severe enough to require extraction of the four largest teeth, and choice should fall rather on the premolars, which are not so wide and which have the advantage of providing space near the front of the mouth where it is readily available for the incisors and canines. The first permanent molars are more prone to decay than other teeth, and in cases where it is doubtful whether they will last until adult life it may be as well to remove them at a time when the spaces will tend to close up. The fate of individual teeth cannot be decided purely on their own merits; the equilibrium between the two jaws must be considered. Extraction of lower teeth may call for a reduction of teeth in the upper jaw, though loss of upper teeth does not necessarily call for compensating lower extractions. Sometimes the removal of the first permanent molars may lead to excessive overlap of the upper and lower incisors, a condition unfavourable to the health of the incisors in middle life; sometimes the vertical position of the upper incisors is not maintained, and the natural fullness in the lip contour gives way to a shrunken appearance; sometimes spaces persist which are small enough to allow food to lodge between the teeth and cause discomfort and not large enough to permit the tongue to clear them easily. In other cases the crowns of the lower second molars may tilt forward, forming a stagnant triangular area between themselves and the tooth in front, and this leads to local lesions of the periodontal membrane. The second premolar commonly travels backwards, leaving a considerable space in front of it, in the region where the effort of mastication may be most concentrated. Veterans can remember a similar vogue for removing the first permanent molar thirty years ago. Today we may doubt

1. *Brit. dent. J.* 1940, **69**, 269.

whether there is a panacea for dental ills. The vagaries of the single case must be assessed by the dental surgeon to the best of his ability, and the treatment varied accordingly.

CHLOROFORM IN OBSTETRICS

NO-ONE would willingly reopen the old controversy about whether to use or not to use chloroform in labour, but Sheehan's[1] paper on acute yellow atrophy and delayed chloroform poisoning should not be overlooked either by habitual devotees of chloroform or by those who use it but rarely and then with misgivings. Both true acute yellow atrophy and obstetric yellow atrophy, which is a definite and separate entity, can be associated with labour without chloroform anæsthesia; they are similar clinically but the former arises from a gross liver necrosis and is very rare in pregnancy, the latter from a gross fatty change in the liver with an entire absence of necrosis. Sheehan describes delayed chloroform poisoning as being far commoner in obstetric than other types of patients, and maintains that this is not generally realised because the liver lesion is not always recognised as due to chloroform and is ascribed to the obstetric complications. Three types of lesion are associated with three types of patient. In the first there is an isolated cell lesion with a distinctive necrosis of scattered individual liver cells. This is the rarest form of delayed chloroform poisoning and occurs as the result of overdose in a healthy subject. Sheehan describes two cases, one dying 18 hours and the other 2 days after chloroform anæsthesia for delivery. The commonest type is the second, a mid-zonal necrosis. Of the nine cases cited by Sheehan all had a long labour before the administration of chloroform began (a mean of 3¾ days). Two of the patients died within a day of having chloroform; the others developed typical delayed chloroform poisoning and died 3–5 days after the administration. Some of these patients had relatively short anæsthesia, the longest being 45 min., and there was no clear relation between the amount of chloroform used and the severity of the illness. All of them had been almost starved for a few days before the chloroform was given and were probably in a condition of starvation acidosis, in which there is a nitrogen retention apparently due to oliguria from pressure on the trigone and ureteric orifices.[2] The third type, with a central necrosis, was found in two patients, each of whom had hyperemesis; they aborted with chloroform without preliminary intravenous glucose and died 3–4 days later with the clinical picture of delayed chloroform poisoning. These patients have a metabolic disturbance which includes both an acidosis and a gross uræmia, apparently related to the anhydræmia. The gross fatty infiltration of the liver seen in delayed chloroform poisoning in children apparently does not arise in obstetrics. Sheehan concludes that a healthy pregnant woman is normally resistant to chloroform, and the risk of liver damage from chloroform anæsthesia in such a patient is therefore remote, but that this risk is very real in patients who have a gross metabolic disturbance before their anæsthetic begins. The common factor in all cases, and one which is easily obviated and treated, is a starvation acidosis. He urges that as much attention should be given to the anæsthetic as to the obstetric problems. The history of the few days prior to anæsthesia is all-important, for, as Sheehan says, "the patient who has been left in labour for a few days without adequate treatment is extremely susceptible to what may be regarded rather as a poisoning by delayed chloroform than as a delayed poisoning by chloroform." He accounts for the greater frequency of delayed chloroform poisoning in obstetric hospitals than in domiciliary midwifery on the ground that it is to the hospitals that patients are brought for delivery when there has been long delay in labour and when starvation acidosis has therefore developed. If the history of the previous two or three days is studied he maintains that almost every case can be foreseen before the anæsthetic is begun, and that the general prohibition of the use of chloroform for fear of delayed poisoning is wholly unnecessary. Those who advocate chloroform in obstetrics can therefore point triumphantly to this article as vindicating their opinion, provided adequate precautions are taken. Sheehan does not touch on the incidence of immediate fatalities under chloroform anæsthesia and these are responsible for the opinion of many that the use of chloroform is unjustified because they cannot be foreseen, and because experience on the part of the anæsthetist cannot prevent them. Nevertheless, sudden death under chloroform in the labouring woman is extremely rare. These patients and these alone look forward eagerly to the arrival of the anæsthetist, and hence in them there is no fear of the anæsthetic itself, and therefore no outpouring of adrenaline into the blood-stream during induction. And it is the simultaneous action of adrenaline and chloroform on the heart which seems most likely to lead to fatal ventricular fibrillation.[3]

1. Sheehan, H. L. *J. Obstet. Gynæc.* 1940, **47**, 49.
2. Crawford, M. D. *Ibid*, 1939, **46**, 540.

SEROUS FLUID

TEXTBOOK accounts of the different pathological fluids found in serous cavities tend to be clear-cut because most of them are a legacy accepted without criticism from older authors, but the clinician has good reasons for disillusion. When a pathogenic organism is isolated, or, more rarely, when a diagnostic group of tissue cells is seen, diagnosis is simple, but commonly the evidence is only circumstantial and not too trustworthy. Paddock's[4] review of more than 1500 fluids collected over 25 years is one of the few critical analyses of the accepted data. Apart from looking at a fluid the usual starting-point is the specific gravity and it is often held that 1016 is the dividing line between dropsical (transudative) and infected (exudative) fluids. Paddock found that 313 cardiac fluids from the pleural cavity had an average specific gravity of 1010 but 10% were 1016 or more; while tuberculous fluids averaged 1020, with 10% 1016 or less. In ascites 95% of cirrhotic fluids were in the transudative range while neoplastic fluids both from the pleura and peritoneum were evenly divided between the exudative and transudative specific gravities. A curious discrepancy exists between cardiac fluids from the chest and those from the abdomen, a third of the latter having a specific gravity of 1016 or more, with a correspondingly high protein content. It seems then that the boundary between the specific gravities of transudates and exudates is a broad elastic band rather than a sharp line. The cytological and biochemical findings in aspirated fluids are also variable though there are a few general indications to help in the individual case. Erythrocyte counts of over 10,000 per c.mm. were found by Paddock in two-thirds of neoplastic fluids and in a third of cirrhotic and pulmonary-infection fluids, but the possibility of damage by the puncturing needle may lead to doubt of the accuracy of all such figures. White-cell counts are more useful, but in 85% of fluids associated with acute pulmonary infection, in 73% with tuberculosis and in 42% of neoplastic fluids there was a total count of more than 1000 per c.mm. The high polymorphonuclear leucocytosis in pyogenic infections is a great aid but there may be such a neutrophilia in non-infected cirrhotic fluids and in early tuberculous effusions, and Paddock records 9 proved cases of tuberculosis with more than half the cells polymorphonuclear. It follows that even with the most familiar pictures one has to be on guard in interpreting cellular findings. The same can be said of the protein content of the various types of effusions.

3. See Macintosh, R. R. and Pratt, F. B. Essentials of General Anæsthesia, Oxford, 1940, p. 174.
4. Paddock, F. K. *New Engl. J. Med.* 1940, **223**, 1010.

The albumin-globulin ratio remains as a rule the same in serous fluids as in the blood, but it is commonly found reversed in cirrhotic fluids. The rarer types of fluids, such as chylous, mucinous and cholesterol, are associated with fewer primary conditions, but Paddock found chylous fluids from 5 patients with cirrhosis, 3 with neoplasm, 2 with nephrosis and 1 with subacute bacterial endocarditis. Mucinous effusions are apparently always associated with some malignant growth in the abdomen.

LEUKOPLAKIA AND KRAUROSIS

THE term leukoplakia vulvæ, in itself so specific and descriptive, has been loosely employed by gynæcologists to describe any condition of the vulva accompanied by white sodden and hyperkeratotic epithelium. Dermatologists have for some time been pleading for a restriction of the term to its proper place and Agnes Savill[1] has attempted an exacter definition of what constitutes leukoplakia and kraurosis. She divides leukoplakia vulvæ into three categories. The first is false leukoplakia, really a lichenification of the vulva, due to prolonged irritation from scratching induced by pruritus; the normal skin grooves become exaggerated and the skin resembles grained leather; the colour of the skin surface is normal, pale or grey and covered with fine scales. This condition resembles that described by Victor Bonney[2] as lipidosis vulvæ. It is never a precancerous condition and removal of the cause of the scratching results in permanent cure. The next important division of so-called leukoplakia is leukoplakic vulvitis. Bonney defines this as an inflammatory condition with simultaneous changes in the epidermis and underlying connective tissue; both labia, clitoris, prepuce, posterior commissure, and, later, perinæum and anus are affected, but never the vestibule or the skin of the mons. In the first phase the affected parts are red and swollen; in the second the labia are white, thickened and retracted; histologically this phase shows epithelial hypertrophy, elongation of the interpapillary processes, lymphocytic infiltration and disappearance of the elastic fibres in the upper part of the dermis with an increase in the deeper part. In the third phase there is dense whiteness with red fissures, and the labia become flattened out. In the final phase connective-tissue sclerosis is complete; the affected area is smooth and shiny, and the elevations of the labia and clitoris are almost ironed out. There is no longer any pruritus. This is a precancerous lesion. The end-result may be a contracted introitus that closely resembles that left by senile kraurosis. The third division, true leukoplakia resembling that seen on the tongue, is very rare.[1] The importance of Savill's classification lies in the segregation of leukoplakic vulvitis from simple lichenification of the vulva. The treatment of leukoplakic vulvitis may well be radical surgery on account of its precancerous reputation, while that of lichenification of the vulva can never be. The term kraurosis should be reserved for a progressive sclerosing atrophy of the mucocutaneous coverings of the vulva, leading in time to a stenosis of the vaginal introitus and an obliteration of the prominence of labia and clitoris. The mucous membrane is smooth, dry and shiny; the colour is white, yellow, red or spotted. Often there are small telangiectatic spots especially around the urethral orifice, giving the appearance of a carbuncle, though falsely. According to Savill kraurosis may be caused by involution of the ovaries produced by surgery or old age; or it may be associated with a recurrent infective dermatitis. The second type affects much younger patients in whom the ovarian function is as yet unimpaired; the pathology seems to be exactly similar to that of the later phases of leukoplakic vulvitis. The pendulum has swung back to the opinion of the gynæcologists that leukoplakia and kraurosis are—with reservations—one and the same disease. There is much of interest in Savill's paper, but we cannot agree that the proper treatment of senile kraurosis is electrotherapy, when hormone treatment properly exhibited in suitable dosage has given such uniformly excellent results.

1. *Brit. J. Derm.* 1940, **52**, 321.
2. *Proc. R. Soc. Med.* 1938, **31**, 1057.

SEX AND AGE DIFFERENCES IN TUBERCULOSIS

THE relatively high rate of mortality of young adult females from respiratory tuberculosis and its reluctance to decline in recent years are well-known features of this disease. Reliable statistics of its incidence in the two sexes and at different ages are more difficult to come by and of interest, therefore, is a study recently made by Prof. R. M. F. Picken of the data published in the annual reports of the Welsh National Memorial Association.[1] In the four years 1936–39 a total of more than 9000 new cases were reported, of which approximately 5000 were males and 4300 females. In the first years of life, 0–14, there is no sex difference in incidence. The populations at risk differ but little and there were 334 male and 343 female patients. In young adult life, 15–24, on the other hand, there is a distinct excess of female cases, 1760 to 1403 males, although at these ages the female population is rather smaller than the male. At ages 25–34 there is again little difference between the numbers at risk, and the incidence is also of the same order with 1123 male and 1205 female cases. After age 35 there appears a pronounced excess of males—2180 males to 991 females—the populations at risk being approximately the same. Further analysis shows that in the young adult group, 15–24 years, 53% of the females were Tb + in the sputum against 49% of the males, and 37% of the former were classified as clinical group 3 (advanced cases) against 30% of the latter. In other words not only do a much larger proportion of new cases occur at young ages in females but also at these ages the prognosis is less favourable, as measured by the presence of tubercle bacilli in the sputum or the clinical stage to which the disease has progressed. Although the data do not permit the calculation of real fatality-rates they suggest that, once contracted, respiratory tuberculosis is a disease of more serious prognostic import among females at practically any age and especially in young adult life. Such observations from statistics accord with clinical experience; they cannot help us to explain these fundamental sex differences in the behaviour of the disease. Are young women, for instance, Professor Picken asks, more exposed to massive infection in the home? Or is their special susceptibility entirely physiological? The answer, he suggests, must come from tuberculosis departments through a combination of clinical and pathological observations with social inquiry.

THE Royal College of Physicians have appointed as their delegates to the B.M.A. Medical Planning Commission Sir Charles Wilson, London, Dr. H. L. Tidy, London, Prof. J. A. Ryle, Cambridge, and Prof. H. P. Himsworth, London. The Royal College of Surgeons have completed their quota of delegates by the appointment of Mr. A. Wilfrid Adams, Bristol, and Mr. John Hunter, London.

THE Vice-Chancellor of the University of Oxford has issued a statement, which has the authority of the Minister of Labour and National Service, saying that the reservation of medical students is unaffected by the proclamation of Jan. 29, and that the extension of the reservation to all medical students is being considered.

1. *Pub. Hlth*, 1940, **54**, 42.

SUBSCRIPTION OFFER TO STUDENTS.—The proprietors regret that owing to the present difficulties and heavy additions to cost they are reluctantly compelled to increase the students' subscription to THE LANCET from 10*s.* 6*d.* to 1 guinea per annum as from 22 February, 1941.

Special Articles

THE PREVALENT DISEASES OF LIBYA

By PHILIP MANSON-BAHR, C.M.G., D.S.O., M.D. Camb., F.R.C.P.

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INFORMATION on the nosology of Libya is difficult to obtain. Such reports as exist, emanating from Italian sources, are scanty and sketchy, and are often derived from hearsay evidence. Thus, the medical survey of this region in the ambitious work by Croveri, "Patologia Tropicale, Subtropicale e Parassitaria" (1935) is marred by the fact that the material appears to be culled from existing works on tropical medicine, rather than from personal observations, and is mainly remarkable for the bombastic foreword by the Duce himself on the political aspects of this region. The epidemiology conforms to that of the North African coast and the diseases are similar to those of the contiguous Western Desert boundaries of Egypt with which I became familiar during the campaigns of 25 years ago.

The colony of Libya (or Tripoli) is of considerable extent and covers an area of approximately 900,000 square kilometres. The greater southern portion is composed of bleak unfertile desert (Libya proper); the northern of a rugged more fertile coastline, embracing small towns and cultivated patches with many historic associations and generally known as Cyrenaica and Tripolitania. This coastal zone, being exposed to the maritime breezes, has a more salubrious and temperate climate, being blessed with a more abundant rainfall, than the torrid, arid interior. The Italian colonists have divided the colony climatically into graduated zones—the maritime, steppe, subalpine, semi-desert and desert proper. The rainfall is sporadic, limited to the months of October to March with a maximum intensity in December.

MALARIA

Although benign tertian and quartan malaria are reported from the coastal region, it is the subtertian (*Plasmodium falciparum*) which is the most widespread and feared in the Southern desert (Fezzan), and, as in similar situations in Egypt and Algeria, a virulent type is met with in palm-fringed oases which under war conditions assumes most puzzling and protean forms, so much so that its true nature is often not suspected by the unwary. From experience gained in the last war it appears that the most virulent forms occur most frequently in the cold season, as at the present time, and are conveyed by hibernating mosquitoes. The main anopheline carriers are *Anopheles multicolor*, which breeds in salt water, and *A. sergenti* which breeds in fresh (Kirkpatrick 1925), so that the former is more likely to be prevalent in the coastal districts and in brackish water in the interior.

Subtertian malaria may manifest itself under such circumstances by prolonged typhoid-like pyrexia. Splenomegaly, which is commonly stressed in textbooks, in primary affections is not always evident in these cases. The algid cases, which form a high proportion, may assume an abdominal complexion, often associated with diarrhœa and dysenteriform symptoms and with intestinal disturbances, suggesting an abdominal complication, so that their true malarial nature may be overlooked. The clinical signs may be confined to the hepatic region, simulating cholecystitis, or to the right iliac fossa, suggesting appendicitis. Surgeons especially should beware of these abdominal pitfalls and not be tempted to operate without ample microscopical investigation of the blood. The cerebral forms may be comatose or epileptiform, and if hyperpyrexia is present may be mistaken, as they often are, for sunstroke or heatstroke. Cerebral involvement may simulate mental disturbance, such as mania, or even alcoholism. Cardiac and pulmonary forms have also been met with under war conditions. In fact there is no limit to the clinical disguises which this type of malaria may assume.

It is necessary to emphasise the value of intramuscular or intravenous injections of quinine dihydrochloride in these severe cases. None of the newer antimalaria drugs can compete in efficacy with that of quinine in these emergencies, although Atebrin (mepacrine hydrochloride) is undoubtedly beneficial in the less severe cases. This drug acts best in conjunction with moderate quinine therapy. Blackwater fever as a sequel to subtertian malaria may be occasionally met with in the southern desert of Fezzan.

Although subtertian malaria holds pride of place, yet benign tertian, on account of its persistency and liability to relapse, constitutes a severe military handicap. It is in this infection that a combination of Plasmoquine (pamaquin or Præquine) and quinine is most effective in preventing relapses. Quartan malaria from the military viewpoint is negligible.

LEISHMANIASIS

Visceral leishmaniasis, or kala-azar, occurs sporadically along the whole Mediterranean coastline. When it turns up it is a medical curiosity, but it should be borne in mind that it is there. Mediterranean kala-azar is mainly found in children and the strain of parasite is designated *Leishmania infantum*; it is probably conveyed by the bite of a sandfly *Phlebotomus perniciosus*. A similar indigenous infection is found in the local dogs and is known as *L. caninum*. The close association with the human disease is probably more than fortuitous.

The easiest and most practical method of establishing diagnosis is by gland puncture. It has only recently been discovered that in kala-azar there is a generalised adenitis and that the inguinal lymph-glands are almost invariably enlarged. I have confirmed this in the last seven cases investigated, and, following the method of Kirk and Sati (1940) have been able to demonstrate Leishman-Donovan bodies in preparations made by gland puncture. This is a simple procedure. The gland is pinched between the finger and thumb and a dry sterile hypodermic needle (No. 16) is inserted into it. By massaging the gland, the lymph is forced into the lumen of the needle; by affixing the barrel of the syringe it is blown on to a slide, then dried, stained with Leishman's stain, and examined.

According to Adler and other authorities, the North African kala-azar is more resistant to antimony treatment than are Indian cases, but Adams and Yorke (1939) have recently introduced a new compound, 4 : 4' diamidino-stilbene, which has been tried out in Palestine by Adler and Rachmilewitz (1939) with eminently satisfactory results. It is administered by the intravenous route, 360 mg. being given within seven days.

Cutaneous leishmaniasis, or oriental sore, occurs sporadically along the whole North African coast, beginning as a papule on the face, hands or other exposed parts of the body. It breaks down into an ulcer of highly characteristic appearance. The diagnosis is usually easily made in the early stages and *Leishmania tropica* can be identified in the serum obtained from the edges of the sore by puncture with a hypodermic needle. These sores spread in a chain manner via the lymphatics, where they cause nodules to form and in which leishmania bodies may often be demonstrated. This disease is also conveyed by a sandfly, the carrier being *Phlebotomus papatasii*. A great number of remedies have been advocated. In multiple sores intravenous antimony therapy seems to be effective. In localised individual lesions a cignolin paint seems to be most satisfactory. The formula I advocate is as follows:—

℞ Cignolin	.. ..	gr. 4
Ichthyol	.. ..	gr. 8
Ol. cadini	.. ..	℥ 40
Benzoli rect.	.. ..	ad. ℥i

Fiat pigmentum. To be applied to the sore daily for 14 days.

RELAPSING FEVER

Relapsing fever is a common North African disease and is of two types. There is the universally louse-borne infection which is prevalent amongst the Bedouin Arabs, especially during the winter months when they lie huddled together and swathed in not over-clean blankets, and which under these conditions is commonly associated with typhus. Then there is the tick-conveyed form, the organism of which Croveri asserts is identical with *Spirochæta duttoni* from Central Africa. Much more probable it is the strain known as *Spirochæta hispanica* which is conveyed by a soft tick—*Ornithodorus marocanus*

or *erraticus*. The remedy for these fevers is, of course, intravenous injections of Neosalvarsan. It may well be that the animal reservoir-host of this spirochæte is the desert rodent (*Ctenodactylus gondi*) known as the "gondi rat."

The Italians mention *sodoku*, or rat-bite fever, which is said to be found locally, but this is a universally distributed disease caused by a minute spirochæte *Spirillum minus*, and the reservoir-hosts are rats, mice and cats, by which it is conveyed to man through the bite. Here again Salvarsan is the remedy.

TYPHUS

Typhus is an Arab disease. The epidemic form, louse conveyed, is prevalent among the Bedouins during the winter months. The rash is often difficult, if not impossible, to distinguish on the dark skins, but may be made more evident on the arm by compression of the brachial vein. The sequelæ of typhus among these nomads may often be more terrible than the fever itself. Then there is the tick-conveyed "fièvre boutonneuse." The tick concerned is *Rhipicephalus sanguineus*, the common dog tick, and this animal is considered to be the reservoir-host of the virus. A distinctive feature is the appearance of a primary sore at the site of the infecting bite which may subsequently become gangrenous and is known as the "tâche noire." Lymphangitis subsequently develops. The cause of this fever and the rash it produces are very similar to those of the louse-borne disease. The diagnosis of typhus fever has been placed on a more secure basis by the Weil-Felix reaction; in cases of typhus the serum agglutinates emulsions of *Bacillus proteus* X 19 to high dilutions. This proved of great assistance in diagnosis during the last war, especially in the louse-conveyed disease. This reaction is not, however, found in fièvre boutonneuse and there appears to be some doubt whether serum from patients with this disease gives a reaction with the allied strain *B. proteus* X K.

SANDFLY FEVER AND DENGUE FEVER

These are two North African insect-borne fevers which are quite distinctive and may be of considerable military importance in the warmer months, especially towards autumn when the insects which convey them abound. In the former the carrier is the sandfly, *Phlebotomus papatasii*, and in the latter the domestic mosquito, *Aëdes aegypti*. Both diseases are due to a virus which undergoes a course of development in the body cavity of these insects.

Sandfly fever is of short duration, lasting as a rule from three to four days. There are few distinctive signs apart from the injected conjunctiva which gives to the facies a bloodhound-like appearance which has given rise to the popular name "dog-faced fever." It is now thought that the virus is conveyed from one generation of the sandfly to the next by the habit of the larvæ of feeding on the decomposing carcasses of their progenitors which contain the essential cause of the disease.

Dengue fever lasts from seven to ten days and culminates, in the majority of cases, in the characteristic dengue rash, described as being half way between measles and scarlet fever. The bone pains of this fever are quite characteristic and the patient usually feels more ill than he really is. In both these trivial fevers it is the disability during convalescence which constitutes their most serious influence on military effort.

DIETETIC DISEASES

Of the dietetic diseases pellagra is most often seen in the aborigines of Libya. It is essentially a malady of the underfed peasant farmer, and is not likely to be encountered, as it was in the last war, in British troops. The causative diet is one deficient in protein, and it has been conclusively proved by Spies and his colleagues that lack of the P.P. factor (nicotinic acid) is the basal cause. The mainstay in the diagnosis of pellagra is the triad diarrhœa, dermatitis and dementia. Beri-beri is also a war disease of this region and manifests itself usually in the dry paralytic form. Under modern conditions it is easily curable by injections of vitamin B_1 (aneurine or thiamin).

DYSENTERY

The dysenteries are war diseases par excellence. In Libya, as in other parts of Africa, the bacillary form predominates, and this acute and often fatal disease is mostly to be feared in desert warfare. The infection seems to be conveyed by the house-fly, *Musca domestica*, which swarms in this region. It is to be hoped that lessons learned in the desert campaigns of the last war will not be overlooked in this—that bacillary dysentery (Shiga, Flexner and Schmitz infections) will be readily recognised and promptly dealt with by well-accredited remedies. The chief danger is that it may be mistaken for amœbic dysentery and emetine injections given to the detriment of the patient. The main modern development in the treatment of acute bacillary dysentery is the recognition of the value of transfusions of blood, plasma, or even reconstituted plasma, in overcoming the dehydration and preventing collapse. Anti-dysentery serum (anti-shiga serum) is of special value in Shiga infections. Targesin, a complex colloidal combination of albumin with a diacetyl tannic acid silver salt, has been well spoken of. The dose is two tablets by the mouth three times a day. Moro's apple diet as a remedy against uncontrollable diarrhœa is also to be noted. The explosive desert diarrhœas known as "gippy tummy" are probably manifestations of infection with Sonne's bacillus. Such conditions are apt to be extremely disagreeable, as well as debilitating.

Amœbic dysentery is a long drawn out and wearying disease which may assume a great variety of clinical forms and is seldom either very acute or fatal. This infection, which is undoubtedly water-borne, is widely spread through the cultivated coastal districts. Exact figures are difficult to obtain. Grixoni has stated that *Entamœba histolytica* cysts occur in 1·8% of the Libyans, which seems a low figure compared with Egypt. Similarly the assertion of Corradi that this protozoan accounts for 82% of clinical cases is probably an exaggeration. It will more likely be found that amœbiasis accounts for 7–10% of the cases of "clinical dysentery." The importance of eradicating amœbic infection from the intestinal canal with emetine bismuth iodide cannot be overstressed.

HELMINTHIC DISEASES

Ankylostomiasis is said to be prevalent; its extent is unknown, but is probably comparable with that which obtains in Egypt among the native Libyans. From experiences gained in the last war it is improbable that it will spread to the Imperial troops. *Tænia saginata*, the beef tapeworm, is said to be common and arises from eating the beef of native cattle and possibly camel meat as well. Ascaris and threadworm are prevalent, and attention may be drawn to the simple method of treatment with phenothiazine in doses of 4–8 g. daily for 5–7 days (Manson-Bahr 1940).

Bilharziasis is also widespread throughout North Africa. The urinary form *Bilharzia hæmatobia* occurs in the desert oases, especially in the Southern districts of Fezzan and Ghat. The intermediary host is, as in Egypt, the snail *Bullinus contortus*. In some districts, according to Zavattari (1934), 60–80% of boys and 15–20% of adults are infected. The intestinal form, *B. mansoni*, has also been found (Cicchito 1938), and the intermediary host appears to be *Planorbis pfeifferi* which is especially numerous in the oasis of Ghat.

VENEREAL DISEASES

Croveri says that yaws is prevalent in Arabs, but it is improbable that it is the same disease as is present in Central and

FIG. 1—Desert sore. Early vesicular stage. Diphtheria bacilli isolated by culture.

East Africa. It is more likely to be non-venereal Arab syphilis, known throughout the African desert as bejel. This appears to be a mild form of syphilis of so attenuated a strain that it fails to reproduce the major features of the disease as it manifests itself in Europeans. In many instances the primary infection is acquired by contact and not by the genital route. Nerve complications are apparently extremely rare and it is readily amenable, as is yaws, to salvarsan therapy.

Ulcerating granuloma, that particularly loathsome venereally conveyed disease, with its peculiar features and method of spread, is much to be dreaded in this part of Africa. It is necessary that it should be detected early, when it is amenable to antimony therapy.

Lymphogranuloma inguinale, or climatic bubo, is an almost universal infection among the native inhabitants. The main thing is to recognise the characteristic buboes. The causal agent, an ultramicroscopic virus, is amenable to sulphanilamide treatment.

SORES AND ULCERS

The septic sore, or veld sore, is primarily a disease of the desert and occurs on the knees, hands and other exposed

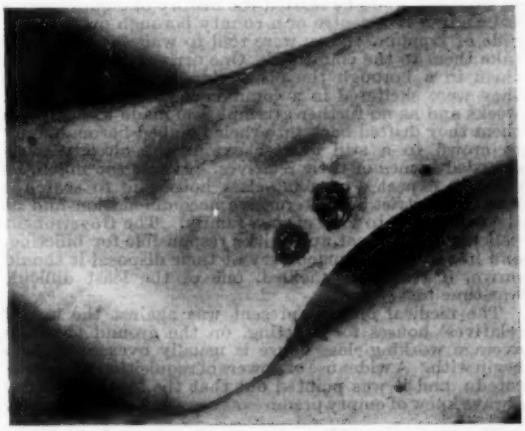

FIG. 2—Desert sore. Chronic punched-out stage. Diphtheria bacilli isolated by culture.

parts of the body. Many of these sores are due to a diphtheritic infection of the skin, as originally described by Craig (1919) in the Sinai Desert. They run a special clinical course beginning with a vesicle (fig. 1), usually round a hair follicle, and at the site of some previous injury; this bursts and forms a shallow ulcer which is acutely painful. A chronic punched-out ulcer with undermined edges results and may persist over a very long time (fig. 2). In a proportion of cases diphtheritic paralysis may ensue, either of the iris, hands or feet, and, not infrequently the sores are associated with faucial diphtheria. They are found mostly in cavalry units, in the camel corps, and to a less extent in the infantry and mechanised units. They respond readily to antidiphtheritic serum. Already a large number have been reported from the Middle East and are identical in appearance with those seen 25 years ago. Diphtheritic sores have lately been found on horses, and this may be a source of the human infection. There are other kinds of septic sores which may develop at the site of any small scratch or abrasion.

The true tropical ulcer, or sloughing phagadena, is commonly seen in underfed natives. The ulcer, which is usually on the legs, is larger and deeper than the septic sore, and is rapidly spreading and extremely destructive of the underlying tissues. The best and most practical method of treatment is by elastic plaster bandages.

SCORPIONS, VENOMOUS INSECTS AND SNAKES

The Libyan desert is a land of pests and may be literally said to "rain scorpions." Seventeen species are listed by Zavattari (see Medulla 1937). The most dangerous is *Prionurus australis*, especially during the hot season, when its sting has sometimes proved fatal to children and old people (Sergent 1938). The chief symptom of the sting is a burning pain radiating from the part. The sting itself is often so small that it is very hard to detect. Profuse salivation is usual. The treatment is almost entirely symptomatic, but in severe cases anti-scorpion serum may be injected.

FIG. 3—Black-widow spider, *Latrodectus lugubris*.

Venomous snakes include *Naja haje* the African cobra, and among the vipers are three species—*Cerastes cornutus*, the horned-viper, which is specially deadly and perfectly camouflaged by its markings, *Cerastes vipera* and *Echis carinatus*, the Indian "phoorsa."

Finally, there is the black-widow spider *Latrodectus* (fig. 3), commonly distributed throughout this area. The species is probably *L. lugubris*. There are conflicting accounts regarding the severity of the effects of the bite of this insect, but the main feature is that occasionally it produces the appearance of an acute abdomen, with board-like rigidity and great tenderness. The main point is to recognise that this is a toxic phenomenon and not to operate. The toxin of the poison glands is a powerful hæmolysin, causing œdema and inflammation at the site of injection and sometimes an urticarial rash.

I am indebted to the director and staff of the Bureau of Hygiene and Tropical Diseases for procuring references of local interest, and to Captain Manton, Army Dental Corps, for the photographs, which were taken in Palestine during this campaign.

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A CONFERENCE ON A.R.P.

WHEN the Government, in those distant days before Munich, came to consider plans for A.R.P. they had to parcel the country into administrative areas and they decided to divide it into a number of civil defence regions too large to deal with the detail of planning. It still remained to be decided which areas should be given the local autonomy of a scheme-making authority. The Government chose county councils, the county boroughs, city councils and the metropolitan borough councils to be the authorities for this purpose. This decision, apart from giving an added impetus to machinery which many had in the past declared to be outworn, and apart from its perpetuation of boundaries formed by the union of 19th century vestries and the barter of properties in the Middle Ages, also gave to these local authorities the chance to justify their existence by the execution of a task bigger than any they had hitherto undertaken. It is fair to say that the manner in which the scheme-making authority deals with its civil-defence responsibilities will constitute its claim or otherwise to survival in the reconstruction which will follow the war. The administration of casualty services is not the least part of such an authority's responsibilities, and many a man in general practice is now making his first contact with local government through his work in first-aid posts and mobile units. We in the medical profession know only too well the contradictions and the difficulties—some of local, some of central origin—which are involved in this work.

On Feb. 2 a conference was jointly held in Islington Central Library to which authorities in the London

region which administer a civil-defence scheme were invited. It was attended by representatives from about half of the authorities of that region, who all explained that they attended in their personal capacity and were in no way mandated by their authorities to express their view. The administrative side had a fair representation, there being apart from councillors and engineers some eight medical officers of health and a few members of the E.M.S. The two bodies which combined to call the conference were the Association of Architects, Surveyors and Technical Assistants and the A.R.P. Coördinating Committee, with which Prof. J. B. S. Haldane and Prof. J. R. Marrack are closely associated.

THE SHELTERS

Medical men are prepared to recognise in an increasing degree that their responsibilities extend beyond the mere treatment of such disease as is brought to their notice by the sufferer himself. Today public health is no longer the monopoly of doctors employed by the central ministry and the local governments—indeed, it is these doctors who are the first to stress the fact. Today also the general public are being subjected in an increasing degree to new strain all tending towards a general lowering of health standards. Dr. JOAN MCMICHAEL, starting from this common base-line, addressed the conference on the medical aspects of A.R.P. and quoted from a speech by Mr. Malcolm MacDonald in which he commented on the very real dangers to the public health arising from a "degree of overcrowding literally appalling." In support of this Dr. McMichael gave the standard minimum figures per occupant which the Public Health Acts allow.

Hospitals	1000 cu. ft. per head
Army barracks	600 " " " "
Canal boats	60 " " " "
" " (children under 14)	40 " " " "

She remarked that these figures read somewhat curiously alongside the report of the Horder Committee. "Whenever possible the standard the Ministry of Home Security is at present advising—viz., 50 cu. ft. per person for indirectly ventilated shelters—might be followed until the present position of overcrowding is eased." As Dr. McMichael commented, the population in London which cares to shelter must do so in conditions inferior to those obtaining in a canal boat. Dr. McMichael, in stressing the reality of the danger, quoted figures for the incidence of cerebrospinal fever: 1938, 1288; 1940 (up to Dec. 5), 12,500.

The general feeling of those present was that the structural and medical problems involved in the provision of shelter were so intermingled as to have become inseparable. About this there can be little dispute, though there was considerable argument concerning the official attitude to problems of shelter hygiene, at any rate in so far as planning is concerned. As one delegate put it, "The policy of installing medical and nursing staff in shelters without even attempting to remedy structural hygienic faults is a policy of waiting for the worst. To provide at the same time bad shelters with efficient medical aid is like throwing banana-skins on to a rush-hour pavement and handing out splints five yards further down."

The general tone of the discussion was extremely critical of the Government's A.R.P. policy. It was chiefly the Ministry of Home Security that suffered as being the department responsible for the primary design of the shelters. The opinion of the conference was plainly to the effect that no-one could make a sound job of caring for shelterers under the conditions in which the ministry preferred to confine them.

The cost per head of shelter accommodation decreases with a rise in the number of persons sharing it. Such elementary amenities as water-closets and air conditioning plants have an alarming cost if this is spread over say twenty people; but expenditure falls to a practicable level if spread over several hundreds of users. The Ministry of Home Security does not like large shelter units and all attempts to demonstrate the convenience and economy of the larger communal shelter have met with little sympathy. Models were shown of large reinforced concrete shelters which have been popularised as "Haldane shelters." As Professor Haldane has pointed out, these shelters are based upon Mr. Ove N. Arup's designs which the Finsbury metropolitan borough council adopted as reaching the required standard for a crowded area. These shelters are really an aggregation of similar reinforced units so that a high degree of safety is achieved as well as a high level of "amenity." Actually safety, rather than decreasing with grouping, considerably increases, since the honeycomb of reduplicated walls has an obvious cumulative effect in isolating the force of an explosion.

THE HOMELESS

One of the paradoxes of the blitz is the plight of those bombed out of their homes. It is odd that the homeless and the wounded are the two classes of our population for whom shelter is provided only in the most exceptional circumstances. Once in the converted L.C.C. school which serves as a rest centre the homeless have usually to be content for their protection against bombs with a fabric designed in the 19th century merely to exclude the elements. The Rev. S. EVANS of Plaistow urged that those whose homes have been bombed in no way deserved to be treated as paupers. They were simply citizens deprived of their possessions by disaster, and who had been through a stiff ordeal. As an instance of what not to do he related the history of eighty human beings in a rest centre of a county borough on the East Side of London. They were told to wait for a "bus to take them to the country." One arrived and deposited them in a borough the other side of London. There they were sheltered in a common lodging-house for six weeks and as no further attempt was made to deal with them they drifted back into their bombed borough, only to crowd to a still greater extent the already overcrowded homes of their relatives. It was too much, he said, to expect a working-class housewife to search a bombed district for alternative accommodation and at the same time to look after a family. The Government had made the local authorities responsible for billeting, and in view of the machinery at their disposal it should prove, if resolutely tackled, one of the least difficult war-time tasks.

The medical opinion present was against the use of relatives' houses for billeting, on the ground that the average working-class house is usually overcrowded to begin with. A wider use of powers of requisition was advocated; and it was pointed out that the local rate-office always knew of empty premises as soon as they fell vacant.

The conference felt very strongly the lack of direct contact with the regional commissioners and passed a resolution demanding a right of representation at regional headquarters. It was pointed out that all would benefit by this—the atmosphere at the top would be less rarefied, local problems would be better met, and the public better served.

It became obvious during the course of the day that, whatever doctors themselves may think, the public expects their interest and help in an ever-increasing degree and in an ever-widening field. The war has brought to our large towns a new community life in which no man can escape his responsibilities towards his fellows. The doctor, from the nature of things, touches life at many points and the calls on him are correspondingly greater. Someone summed up one aspect of the medical situation in the phrase: "Beat the germs as well as the Germans." There are other things to beat too, and in planning how they may be beaten it may be well to reflect that rugged individualism and anarchy are much the same thing—and that as a philosophy for victory anarchy is not to be commended.

K. W. C. S.-L.

As a war-time measure the Hospital for Sick Children, Great Ormond Street, with the coöperation of the Watford Peace Memorial Hospital, is opening consultative outpatient clinics at that hospital. At first these clinics will be held once a week beginning on Friday, March 7. Medical and surgical cases should attend at 10 A.M. and ear, nose and throat cases at noon. The clinics will be extended later if necessary. They will be conducted by members of the visiting medical staff of the Hospital for Sick Children, and new cases must be recommended by a doctor. Appointments should be made by letter through the almoner to the Hospital for Sick Children Clinic, Watford Peace Memorial Hospital, Watford, Herts.

In England Now

A Running Commentary by Peripatetic Correspondents

I AM one of those who believe that soldiers should be in proper soldiers' hospitals under the care of soldiers' doctors, but I am not frightened by your insistence (Feb. 1, p. 149) that in these hard times everyone should share the base hospitals. Excepting in so far as his characters are the same as those of all good doctors (not necessarily the same as good physicians or surgeons) the soldiers' doctor is least needed at the base hospital—more in the unit, battalion of infantry or brigade of artillery, and most in the field ambulance, where the C.O. needs to be a tough nut to avoid his brigade group crumbling away from unnecessary illness. Once it is decided the soldier must go down the line his doctor's special characteristics disappear, to reappear in the convalescent hospital or camp. In the base hospital he is only needed to prevent the hospitalisation of men (and women and children) which results from keeping them in unduly long or keeping cases that never should be there. The convalescent camp is a hospital, not a training depot where hardening of the fit man is done. Hardening of the not yet fit man may be begun in convalescence; but give them a chance and the military authorities will expect the convalescent camp to turn out hardened soldiers as well as recovered invalids. If it gets that reputation, M.O.s will refuse to send out cases and will obstruct seniors when they try to do so. Then hospitalisation starts. The convalescent camp must therefore remain a medical unit. I wonder whether it can take civilians as well as members of the Forces. The latter are under military law, and the former are not. Military law is out of place in the convalescent stage; but it may be useful in the background. Toughness combined with kindness of heart—and no doctor is any good without both—can do the job without the help of the C.O.'s orderly-room. If I am right, and it is not just an old man's dream, convalescent camps should take civilians (men and women) as well as the men and women of the Forces, and treat them all together. The Pendragons have shown how to make such a dream come true. And why does the convalescent camp matter? Just because base hospitals get cluttered up with men that should not be there; they are not fit for full duty, but they ought not to be in hospital.

* * *

The latest edict on a triple ration of fat and meat for diabetics is altogether incomprehensible to my mere medical mind. A little mental arithmetic shows that it provides for approximately 135 g. (or 1220 Calories) of fat and 60 g. (or 240 Calories) of meat daily. Most of us who are interested in diabetes are now of the opinion that with a high carbohydrate diet of 200–300 g. daily the amount of fat should be reasonably restricted and 100 g. daily is about the highest level to which the fat in the diet should rise. Why, therefore, the diabetics of the country should be granted such a medically unjustifiably large ration when the children (not to mention the non-diabetic element who are also doing their best to play their part in the defence of their homes) are rationed to the bare minimum of fat compatible with health is one of these problems which, while a headstrong government department may consider it settled once and for all, the medical profession ought to assail with all its power. Is it a question of the vested interests of diabetics—always rather a pampered section of the community—or is it an example of our stupid national habit of sentimentalising over the unhealthy to the extent of victimising the healthy? But, perhaps it is only Whitehall bungling again. I have been glancing over the instructions which we issue to our diabetic patients, and for the life of me I can find no reason why they should have any more than a double ration of meat.

Professor Mottram's recent letter (*Lancet*, Feb. 1, p. 159) voices a fear which has been growing in the minds of many of us. Article after article of food which the Ministry of Food urged us to eat has disappeared from the shops. Cheese was the epitome of all that a foodstuff should be; with cheese as a staple article of food our diet would be satisfactory. Those of us who had long believed in the excellence of the traditional English bread, cheese and beer chortled with pleasure, and non-cheese-eaters soon learned the advantages of the habit; but the next thing we find is that cheese has become a rarity only to be obtained if our unfortunate wives pay repeated visits to the grocer. To the non-politician cheese seems to be the ideal food for storage purposes, and with the tremendous output of our Dominions available the neglect to lay in adequate amounts of it either before or during the early days of the war seems to be verging on either laxity or criminality. Again, there is the latest example of all—oatmeal—announced on the wireless and in the press as *the* food for war-time; and in less than a week not a grain is to be obtained in the shops. Why on earth do foodstuffs disappear from the shops the moment their price is controlled (e.g. onions, poultry, and rabbits); why is food such as meat allowed to rot in the shops until it has to be thrown out as unfit even for pigs, and why are artists appointed regional directors of the meat trade while fully qualified and experienced butchers are sent into the Army to act as infantrymen or clerks? Doctors are notoriously bad administrators or one would pray for the appointment of a medical food dictator.

* * *

There seems to be an all-round drop in the sense of personal responsibility nowadays. So much is done for us that we can, if we like, carry on with very little initiative if our ambitions are modest. The professional man, depending as he does on his own efforts, has as a rule a well-developed sense of responsibility; the artisan in war-time need have almost none. But the professional man can, if he chooses, avail himself of many of the aids which are dangled before the artisan. He can send his children to the council school, he can let them take their chances in the examinations for scholarships at the grammar school and university. That he does not is his own affair. In his actual profession, however, it is not so easy. There he must stand on his own feet, must fight with his own hands, unless he chooses to take a state-paid job. If he does that, and is content to go with the swim, he need exercise very little personal responsibility. His wage will be paid regularly and will increase according to scale. He is certain as anyone can be that, well before he is past enjoying it, he will be able to retire on a pension. A good many of us must be regarding him with envy today—those of us who are faced with a rapidly declining income, rising taxation, an ever-increasing cost of living. In the wage-earning class the average man, woman and young person of today can and does earn a comparatively large wage with little addition to his or her responsibilities. The cost of commodities is bigger than it was and is growing, but they are not in plentiful supply; the artisan can and must spend little more than he did on them. His rent is not increased as a rule. He has no growing school bills to pay. He gets his ordinary doctoring through the panel, treatment at the hospital, if he needs it, through a contributory scheme. If sick he gets a weekly money allowance from the state insurance, supplemented, if he has made provision, by his friendly or trade society. Take it by and long he has little to fear but the loss of his job or a long illness. Society has been so organised that his responsibilities have been reduced to a minimum. But—and it is a very big but—the war will not last for ever. Sooner or later there will come a time when highly paid employment will become not a thing to pick and choose but a thing of the past. Then the artisan will find he has responsibilities in bucketfuls. So, for that matter, will everyone else.

For the moment, however, we are considering things as they are. Is well paid, easily obtained, employment a good thing in itself? In some ways it is, but not in all. It used to be axiomatic that nothing was worth having that did not have to be striven for, and on the whole that is true. Today, if works welfare workers and such like are to be believed, some of the younger artisans are becoming increasingly difficult. Disputes concerning wages and conditions of employment are increasing, and that often in the best equipped workshops. While the older men go on with their work some of the younger ones are ready to down tools with little provocation. They know that they can get another job without difficulty. This, let it be stressed, is true only of a small minority. The great majority are content to carry on, big wage or no big wage, because they know they are needed. The spirit of

patriotism is a very real thing; but there are men, usually quite young, in whom it does not burn so brightly. Why is this? The same process is at work here as in the increase in juvenile crime, which a peripatetic correspondent of Feb. 1 put down largely to irresponsibility. Just as children and young persons commit antisocial acts from thoughtless selfishness, so the young men, having had so much done for them, have never even begun to think in terms of other people. In taking anything that strikes their fancy children do not consider the point of view of the owner. Indeed, when the question is asked in the juvenile court, "How would you like it if somebody else had taken *your* things?" the answer "I shouldn't" has been given as apparently something quite fresh. Perhaps our system of education is to blame, by concentrating overmuch on purely material things. In our elementary schools everything that will add to the material comfort of the children is being supplied in abundance—the class-rooms are well lighted, well spaced and airy; the furnishing is almost more than could be desired. The lavatory accommodation is adequate; so are the playgrounds. But is there something lacking? The average healthy child used to prefer toys of his own devising to anything that could be bought. Half a dozen old soap boxes, an imperfect box of battered bricks, were of more permanent value to him than any mechanical toy simply because they enabled him to employ his imagination. The bricks would be anything from a medieval castle to a locomotive engine within half an hour, and next day they would be something quite different. Are our modern methods killing that sense of imagination? Are we taking from the children something we can never replace, and, if so, are not we responsible for much which we deplore?

Our opponents in this war have made it abundantly clear that they are out for world domination, for the trampling down of any who get in their way. They really have much the same viewpoint as the irresponsible child—the entirely selfish one—and this outlook is fostered in Germany by neglect of everything that stands for self-reliance. There everyone follows his leader; he is forbidden to think for himself; he is not even allowed freedom of thought. The result is woefully apparent—a war machine which has proved its deadly efficiency. But it is merely a machine; it lacks individuality and sooner or later it must break. Men and women may be personally irresponsible for a time, but not for always.

We may see something of the shrinking from responsibility in the practice of our own profession, particularly if we live in or near a town with a hospital. A generation or so ago most of us had to depend pretty much on ourselves. There were few outside aids. A well-equipped laboratory was a rarity; X-ray machines were not common, and certainly were not within easy reach. For diagnosis we relied on ourselves, and the evidence we were able to collect by the use of our developed senses. Who does that now? If we are in any doubt, and often when we are not, we send our patient off to this or that expert at the hospital for an opinion. The opinion may be valuable, but the effect on us and on our patients may be less so. For only too often we have not so much shared our responsibility as passed it on. The average young doctor is well up in modern methods of diagnosis and treatment but is shy in applying them himself. How many town G.P.s ever treat a fracture right through? How many so much as see a case of V.D.? Thirty years ago, and less, every G.P. felt himself competent to tackle pretty nearly everything; and *was*! Today he does not think so, and consequently plays for safety. That, not infrequently, is a highly dangerous thing to do.

* * *

We don't consider ourselves hardworked these days, far from it, but the usual early morning muster at sick bay keeps us pretty busy while it lasts. The accepted Service idea of treatment involves seeing as many patients as possible in unit time, and delays are frowned on despite the fact that both we and our staff are largely unoccupied during the remainder of the day. Thus when one day, in the middle of my list, my chief sick-berth attendant announced that the next patient was a Pole I was none too pleased, my linguistic accomplishments being limited; and I foresaw a long and tedious discussion. However, in he came, a tall and well-built fellow with a charming and apparently permanent smile, his uniform smart and clean and his whole appearance most impressive. He halted before my desk, clicking his heels with a sound like a whip, gave a slight bow from the waist and then relapsed into a silent immobility, obviously intending me to take the initiative. I was rather taken aback when my opening sally "What is your complaint?" spoken very slowly and deliberately, brought forth a volley of mangled Anglo-Polish which was quite unintelligible. Evidently flattered by the assumption that he spoke English, he was making the most of the opportunity. This flow was stanched with difficulty, and after a short and awkward pause my "chief" whispered "They usually understand French, Sir!" I choked back the retort that unfortunately I didn't, and delved into my hazy memories of lessons at which I learned a maximum of French grammar and a minimum of idiom. Tentatively I tried "Qu'est ce que vous avez?" to be rewarded by an intensification of the smile and another excited torrent of speech in what was presumably a second national language to him. This also left me cold, so once again an impasse was reached. Just as I was about to eat humble pie and demand an interpreter he suddenly said, in good and precise English, "I have . . ." and then stopped. As this was the first lucid expression I had received I leaned forward eagerly: "Yes?" I said, hoping to hear his symptoms, at last. "I have . . ." (there was a slight pause while he fumbled in his pocket and brought out a small red book) "a dictionary!" and he looked enormously pleased at having remembered the word and its pronunciation. The book was rapidly thumbed and a large forefinger pointed to an astonishingly unpronounceable word against which was the English equivalent "itch." While I digested this information he rapidly stripped and displayed a sweat rash of the groins, and uttered what I took to be the word he had just showed me. Not to be outdone, I commandeered the dictionary, found the English-Polish section and rapidly ran through the pages until I found the Polish equivalent of "sweat" which was some curious word like "pog." "Pog," I said, and again there was a pause, while I considered in which language to put my transitive verb. At last, in desperation, I said firmly, "Pog makes . . . ." (a sort of strangled cry followed as I attempted the Polish word for itch). I looked up expecting incredulity, even indignation, but it had worked! He was delighted at this simple explanation—having evidently expected a diagnosis of tinea or pediculosis, both of which being pretty common at the time—and departed with yet another shattering heel-click. But not before I, in my new burst of confidence, had sunk so low as to say "Fini"! After this brilliant success I bravely faced the next man—a French rating—with "faites voir," to his profound amazement, for his English had been more than adequate on previous occasions.

* * *

If an analysis was made of papers read before the provincial medical societies I fancy it would transpire that most of them are contributed by the staffs of hospitals and specialists. The general practitioners may complain that these, while serving as a modest advertisement to the contributors, do not help them much, and the society's secretary that he cannot get papers from them. How are we to tap the vast clinical and therapeutic experience of general practitioners? They see after-results from their own practices and—an important point—cases returned "cured" from all kinds of hospitals. Here they seem to be in an unique position. Yet our two leading weeklies and two German ones which I read contain but little of their writings. I should like to see occasional numbers of these given over chiefly to contributions from the "backbone," or perhaps an occasional supplement. Or general practitioners might arrange to support representatives of their number, with the requisite attributes, relieve them from practice, and set them to edit a monthly journal controlled and maintained by the practitioners, solely for contributions from their experience.

Since the publication of the last list of subscriptions to the Medical War Relief Fund £800 has been received, bringing the total to over £17,000.

Letters to the Editor

SULPHADIAZINE

SIR,—Recently Roblin and his associates [1] have described the preparation of sulphadiazine (2-sulphanilamidopyrimidine). Feinstone and his collaborators [2] have reported that the acute toxicity of sulphadiazine based on blood concentrations of the drug was in the neighbourhood of from 175 to 200 mg. per 100 c.cm. for the L.D.50 in mice. Chronic toxicity studies on monkeys showed that sulphadiazine produced less tissue damage than did sulphathiazole or sulphapyridine, and the blood concentrations of the drug resulting from given doses of sulphadiazine in monkeys and in mice were about four times as high as those resulting from similar doses of sulphapyridine or sulphathiazole. They noted that the drug existed in the blood primarily in the unconjugated form, because its acetyl derivative appeared to be readily excreted in the urine. These observers noted that sulphadiazine had an excellent degree of therapeutic activity in experimental pneumococcal, hæmolytic streptococcal, staphylococcal, and Friedländer's bacillary infections in mice.

We have been able to confirm these observations. In infections in mice, our experiments lead us to believe that sulphadiazine is approximately as active a therapeutic agent as is sulphanilamide in streptococcal infections. In experimental pneumococcal infections in these animals, sulphadiazine again proved to be about as effective as sulphathiazole or sulphapyridine. In experimental staphylococcal infections, sulphadiazine seemed to be slightly superior to sulphathiazole as a therapeutic agent.

In infections in mice produced by the intramuscular injections of *Clostridium welchii* or *Cl. septique*, sulphadiazine was highly effective when administered either by the oral or local route. None of the drugs which we have tested has proved very effective against *Cl. œdematiens* (*novyi*) infections in mice.

Our studies on the absorption, distribution and excretion of sulphadiazine in man indicate that the drug is somewhat less rapidly absorbed from the gastro-intestinal tract than is sulphanilamide, sulphapyridine or sulphathiazole. In the blood, the ratio of the unconjugated and acetyl fractions of the drug is frequently less than that which has been previously noted for sulphanilamide. Sulphadiazine is excreted less rapidly than is sulphanilamide or sulphapyridine if renal function is normal. In the urine about a third of the drug exists in the acetylated or conjugated form. The relatively small amounts of the conjugated fraction found in the blood seems to be due to the fact that acetyl sulphapyrimidine is readily excreted by the kidney. The drug passes over into the spinal fluid in concentrations of one-half to four-fifths of those which exist in the blood.

It is too early to pronounce on the clinical therapeutic effects of sulphadiazine, but to date our experience with this drug leads us to believe that it is about as effective as sulphapyridine or sulphathiazole in the treatment of pneumococcal pneumonia in human beings and of definite value in the treatment of hæmolytic streptococcal and staphylococcal infections in man. In Friedländer's bacillary infections it has proved very effective.

The interesting thing about this drug is that it has not in our experience (which now covers its administration to about 80 patients) produced any nausea or vomiting. We have noted one instance of drug fever, one of drug rash, and one of conjunctival injection in this group of patients. The drug does not produce a fall in the carbon-dioxide combining power of the plasma, nor have we witnessed any signs of renal injury up to the time of writing. There have been to date no noticeable changes in the red-cell count or hæmoglobin of patients who have received this drug.

It is very easy to obtain adequate concentrations of this drug in the blood, and we feel that in the acute phase of lobar pneumonia a concentration of sulphadiazine of from 7 to 10 mg. per 100 c.cm. should be maintained. It has been our custom to prescribe an initial dose of 4 grammes of sulphadiazine, to be followed at six-hour intervals by 1 g. of the drug; then 1 g. should be administered every six hours until the temperature has been normal for three days.

If the initial promise of high therapeutic effectiveness and low clinical toxicity of this drug is borne out by more extensive experience, it means that sulphadiazine will be a most welcome addition to the sulphonamide group of chemotherapeutic agents.

PERRIN H. LONG.

The Johns Hopkins Medical School, Baltimore, Maryland.

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ARTIFICIAL SHORTAGE OF DOCTORS

SIR,—With reference to your leading article of Feb. 1 on the artificial shortage of doctors, I would ask you to correct a statement regarding orthopædic centres in the Army, which is not in accordance with the facts. It is stated in this article that "the Army has 12 orthopædic centres in addition to those of the E.M.S., with their own establishments to maintain. . . ." The facts are that a number of surgeons with orthopædic training and experience have been authorised for certain military hospitals at home. These hospitals will be regarded as possessing orthopædic sections (not centres) and are supplementary to the E.M.S. orthopædic centres. It is not intended that cases requiring highly specialised reconstructive surgical treatment, or whose return to military duty is doubtful, should be treated in military hospitals. These are to be transferred to E.M.S. orthopædic centres as early as possible. The Army are not calling for occupational therapists and rehabilitation experts from civilian sources.

J. M. WEDDELL,
Colonel; Consulting Surgeon to the Army.

War Office, S.W.1.

SIR,—In reception areas, where the population has recently increased by 50–100%, doctors are still being removed and commissioned in the R.A.M.C.—a sentence to boredom, censoring, deciphering, &c. Surely evacuees and the normal civil population deserve more consideration than this. It seems that a request for exemption is likely to be granted until the end of this winter only—which to my mind is a very short-sighted policy.

It is up to everyone to serve the country to the best of his ability, and it would appear absurd to join the R.A.M.C. where (to quote a phrase from Mr. Handfield-Jones's letter) "there are lots of us here and nothing to do" rather than to stay in general practice where there is an increasing amount of work to do and an ever-decreasing number of doctors to do it. Is it not time that this should be rectified before the general practitioners' work becomes too great and the civil population suffers?

C. CARTER SHAW.

Gt. Berkhamsted, Herts.

SIR,—I agree with you that pooling of the supply of doctors is necessary, and I would suggest (1) that all medical men more than three years qualified should be called up by age-groups to the age of 50 and placed in that pool so as to be available for whatever service—fighting or civilian—most needed them; (2) that in the fixed and mobile A.R.P. posts all doctors under 40 should be replaced by those over that age and by part-time general practitioners; (3) that all public-health appointments during the war should be held by men over 50, and that these appointments should be freed for the time being from the provisions of the local government and sanitary orders.

MEDICAL PLANNING.

SIR,—I have read with interest the letter from Mr. Handfield-Jones in your issue of Feb. 8. As he says, the Army Medical Service is reluctant to reveal the voracity of its appetite for medical officers, but this extravagance is undoubtedly the basis for the present shortage. Rumours now reach us that there is to be another call-up of medical men in the near future. At this time of year, in particular, further conscription will lead to very grave difficulties, more especially in areas where the civilian population has been increased and the medical population diminished. Unfortunately the British Medical Association, which one might have expected to emphasise the hardship to the community and to the elder doctors left behind, appears no longer to be the champion of its members, but rather the handmaiden of the Ministry of Health, and there is little help to be expected from that quarter.

A further point which should be noted is the serious

position arising from the fact that many medical men in the Services are getting out of touch with medicine, and deprived of clinical work will get increasingly rusty as the war goes on. As one ex-house-surgeon writes to me: "One is a mixture of clerk, soldier and first-aid man, in that order." The remedy would appear to lie with the Army Council, who should no longer insist on a medical officer to so many men, for units stationed in this country, but should allow local doctors in many areas to do the half-hour morning sick parade, all more serious cases being sent to hospital as at present.

Lincoln. G. A. BAGOT WALTERS.

PAUL-BUNNELL TEST IN GLANDULAR FEVER

SIR,—I agree with Professor Himsworth when he says in his letter of Feb. 8 that careful record-keeping is necessary so that we can find out if the Paul-Bunnell reaction is specific for glandular fever and if we must classify separately similar syndromes with a negative reaction. But I don't think he will obtain the distinction he wants if he uses monocytosis as a criterion. The blood picture of glandular fever is highly characteristic and four groups of cells among the increased mononuclears can be distinguished.

1. Typical lymphocytes.
2. Typical monocytes.
3. Plasma cells and large cells with dark basophilic cytoplasm probably related to plasma cells; these include the "Türk" cells.
4. Cells which resemble monocytes but do not have lobed or indented nuclei; these cells have been classified by various authors as lymphocytes, monocytes, glandular-fever cells, or simply as abnormal mononuclears; they are very characteristic.

The proportion of these groups varies in every case, but group 4 is always prominent. It is this composite picture that is so typical of glandular fever, and not the presence of any particular monocytosis or lymphocytosis. Neither Dr. Barber nor Dr. Fuller gives clearly typical differential white-cell counts; probably the class of lymphocytes includes atypical forms. Monocytosis is known to accompany infections of the mouth and throat unaccompanied by general symptoms like those of glandular fever (e.g. Hartfall 1934), and a point that suggests that Dr. Fuller's patients had not got glandular fever is that the sternal marrow in one case was unaffected. In the few patients I have examined the marrow always contained cells of groups 3 and 4 and increased percentages of lymphocytes and monocytes. This may be helpful in differentiation.

With regard to technique, a staining combination including Giemsa gives the best results; supravital staining unfortunately gives no more help than this in classifying the abnormal mononuclears.

In the meantime it is probably best to follow Dr. Fuller's example and not report cases as glandular fever if the Paul-Bunnell reaction is negative.

M. C. G. ISRAËLS.

Research Department, Manchester Royal Infirmary.

ENDEMIC FLUOROSIS

SIR,—In your leader of Feb. 15, it is stated, in reference to mottled teeth, "The discoloration appears as opaque white or brownish patches on the enamel and is likely to occur in those who drink water containing more than 4·5 parts per million of fluorine." Since this might give the impression that water of less fluorine content is unlikely to cause mottled teeth it should be noted that there is considerable evidence (mostly American) that drinking water is safe in this respect only if it contains less than 1 part per million of fluorine. I have estimated the fluorine content of numerous water-supplies in Great Britain, and I consider that the limiting figure for drinking water-supplies of 1 part per million of fluorine should provisionally be accepted.

Victoria Street, E.C.4. E. V. SUCKLING.

THINGS TO COME

SIR,—May I offer for the consideration of those who would plan our future some reflections upon 1364 expressions of opinion which lie on my desk? They are some of the replies received by the Medical Practitioners Union to its scheme for a national salaried service for general practitioners. This scheme was circulated to every doctor in the country and their opinions were invited by the provision of a blank sheet with the caption "I am / am not in favour of the principles underlying this memorandum and offer the following criticisms." The replies with which I am dealing were analysed several weeks ago but others which have come in since seem to be very similar in character. We may therefore take it that the 1364 opinions, less 71 which were indefinite, are likely to afford valuable and reasonably accurate evidence of what medical men are thinking today. There were 849 replies in favour of a whole-time service and 444 against. This is an impressive majority but it nevertheless conveys an inaccurate impression. By the mysterious operation of human fallibility the memorandum failed to suggest any compensation for the capital sunk in practices and this was very alarming to those who had purchased, or were still purchasing, shares in established practices. Many of these recorded a vote against the scheme on no other grounds, although it was quite clear from their other comments that they were not at all opposed to the principle involved. The confusion between principle and detail was seen also in other replies, and I think it would be an understatement to say that no less than 75–80% of those who expressed an opinion were willing to accept the principle of whole-time salaried service.

What has caused this great departure from the traditional attitude of the profession? I think there can be no doubt that the National Health Insurance Acts are in great part responsible, although economic facts have been of decisive importance. Insured persons have not shown themselves particularly grateful for the services rendered by doctors, and have been increasingly ready to call them out at any time of day or night with little regard to the real needs of the case. Doctors are also forced to make many millions of visits a year for no better purpose than the giving of certificates on some one particular day convenient to the agents of approved societies. These are two examples of a type of demand which has upset the old balance between doctor and patient. The latter now expects as his right (backed by disciplinary measures) the sort of service which he formerly accepted with gratitude and repaid with some degree of consideration for his doctor. It is possible that I have put this too strongly, but I think it is largely the burden of such service that causes so many doctors favourable to the scheme to harp on the need for settled hours, days off, and regular holidays without the expense of providing a locum. It is scarcely necessary to say much of the economic factors which bear so hardly on general practitioners. Every doctor knows that the low insurance fee and the ever-increasing encroachment of state services have been powerful factors in turning men's minds towards the advantages of a regular salary with a pension to follow. It is in the light of such considerations as these that we must weigh the hundred or so replies which insist that the individualistic type of practice has the great advantage of involving competition, and allows a practical idealism which, they say, is unlikely to flourish under a state system. These replies come mostly from the older members of the profession. They do them honour, for they are prompted by memories of lives spent in exacting and unselfish work of a sort for which no praise can be too high. It will be generally agreed that we must strive to carry over these ideals into a state service, but to the more modern mind ideals alone are not enough and we have to realise that the full advantages of medical knowledge can no longer be brought to bear by isolationists. A new generation has come into being, neither better nor worse than the old, but forced by circumstances to think and to work along different lines. In the medical world it is the line of coördinated state service which has now the most followers, and those who plan for the future must take account of this fact, in its ethical as well as its practical aspects.

There is undoubtedly a widespread revolt against general practice as we know it today. How extensive this has become may be judged not only from the general tenour of replies received but also from the following opinion expressed by a teacher not unknown to fame. "As a general outline of the new service your summary is excellent, and my teaching experience of 35 years amongst medical students convinces me that it will be whole-heartedly supported by at least 75% of young

practitioners." It would almost seem that there remain only the questions of when and in what form a whole-time general practitioner service should be introduced.

Sevenoaks. GORDON WARD.

SIR,—I profoundly disagree with propositions 2 and 3 of Dr. Everard Williams's letter on the future of medicine. He advocates the setting up of official contraceptive clinics; but contraception is an important factor in the falling birth-rate of the country and provides a means of avoiding family responsibility. Yet in proposition 4 Dr. Williams advocates family allowances. Proposition 3 represents an attack on individual rights. The principle carried to its logical conclusion would condemn to death all those who are of no use to the state, and it is precisely against such principles of state worship that we are fighting now. Either there are rights attaching to the human personality, or the personality is to be at the mercy of an omnipotent state. One such right is surely that no innocent life shall be forfeit, and this applies equally to the unborn child and the mentally defective. The study of the hereditary factor in mental defect or disease is still in its early stages; our present knowledge does not justify us in interfering with human rights. This does not mean that I approve of the state spending 30*s*. a week to maintain an imbecile child and only 5*s*. a week to support a healthy one; we must keep a sense of proportion. But in any case the comparison is not a fair one; many mentally defective patients do useful work when gathered into a community and thus in part support themselves.

On what grounds does Dr. Williams induce abortion in a case of rape? Is it on account of the danger to the health of the mother, especially if she is young, or is it because it is feared that the child will be born with physical or mental defects? A recent publication by Dr. Letitia Fairfield reviews about 74 cases of juvenile parturition, some of which were presumably the result of rape. It showed that there was no maternal mortality, but the forceps rate and puerperal morbidity rate were slightly increased over the normal rate. Half the infants weighed less than 7 lb. at birth, 18 were premature, 5 were stillborn, and there was a high incidence of congenital defects: 2 cleft palates, 1 anencephalic fœtus, 1 inguinal hernia and 1 slight talipes. These figures, surely, on medical grounds alone, do not justify therapeutic abortion.

The changes advocated by Dr. Williams are in conflict with the moral law; and where there is conflict between that law and medical therapeutics we can be reasonably certain that bad medicine is being advocated.

Southern Hospital, Dartford. A. D. WILLIS.

TREATMENT OF WAR NEUROSIS

SIR,—There are points in Dr. Dillon's letter of Feb. 1 which I should like to try and answer.

Dr. Dillon asks by what criteria an assessment of the personality can be made before disposal. In the vast majority of cases the main criteria are the reactions of the individual to danger—not only his reactions to current dangers, such as any form of enemy action, but his reactions to danger real or imagined throughout life. What is the history we obtain so frequently from men who, in my opinion and that of others, must be discharged? Throughout life they never lived dangerously, have avoided any threat to their security. A nervous childhood, mother-fixed, regarding the outside world as full not of wonderful things to be enjoyed but of dangerous things to be avoided. They have never climbed a tree, never played football, never fought a fight. For them throughout life fear has always meant flight, they have lived their days not endeavouring to tolerate anxiety but avoiding it. Quite possibly there may have been no overt neurosis before joining the Army because they have so planned their life as to avoid the conditions which would produce anxiety. I do not believe that this type is amenable to psychotherapy because there is no real desire for it; they have found a ring fence within which they can be reasonably content and they only desire to get back within it again. They may even as civilians avoid a breakdown under enemy action because they can either flee or remain immobile in a shelter, but when in the Services they cannot obey their instinctive reactions to danger they break down. They may have had reasonably well-paid but sheltered occupations, or they may have been content on the dole or receiving public assistance, or content to drift from casual ward to casual ward. In all there is the same basic mechanism of flight from any threat to their security. Most of us will agree that these are not the cases which fill our psychiatric clinics in peace-time. They have made their adjustments, and only war with its threat to personal safety breaks down the barriers they have built.

This war is different from the last, particularly because recruits are exposed to the threat of enemy action probably as soon as they join the Services, and may even have been exposed to it before. There are not the chances as in the last war of getting training, discipline and some possible building up of aggression or ideals of service before being exposed to the threat or reality of danger. Many of the cases we are now seeing have only been a few weeks or months in the Army; from the beginning they have reported sick whenever possible, may have never fired a rifle, and no instructor would trust them with one. I do not believe that there is any great number of these cases in proportion to the number of the present intake into the Army, and I am sure they must exist in any conscripted army of any nationality. They must, however, come into the net of the neurosis centres, and those of us who work in them may be depressed at times by their numbers.

I should be the last person to belittle the use of psychotherapy, but there must be something to build on, some real desire not only to be symptom-free but to meet and stand up to war service conditions. Discharge rates are not very satisfactory, but will be more so when the present system of following up has brought replies from units. A neurosis centre has a net with a small mesh and brings in not only anxiety states and hysteria but also epileptics, mental defectives, psychopathic personalities and others. I quite agree with Dr. Dillon that many neurotics have made good soldiers, but they are different in the type of neurotic mechanism from those I have referred to. I think I can assure Dr. Dillon that psychotherapy is still being used in suitable cases.

MAURICE B. WRIGHT,
Whitchurch. Psychiatrist, E.M.S.

A BLASTED HORSE—AND OTHERS

SIR,—The article on what a layman may call a shell-shocked pheasant in your issue of Feb. 8 suggests that similar particulars may be of interest in the case of a horse.

Idol, a very good dray-horse, six years old, had been working for eight months for a London brewery. Last autumn, at 4 A.M., a heavy H.E. bomb demolished a building and twenty houses about eighty yards from the stable, which is on the ground floor. Intervening houses prevented any damage being done to the building, except a skylight, but of course there was a terrific bang and concussion. Fourteen horses, then probably all asleep, were all right except for being frightened and restless. Idol and another lay unconscious. The other (aged eleven) recovered in two hours, and with massage treatment was at work forty-eight hours after, and has suffered no permanent ill effect. Idol lay as dead for over four hours, with such a slow pulse that the stable foreman decided it was hopeless and the humane killer was brought to kill him. Suddenly he shivered all over and got up, but could not use his hind quarters to walk. Fomentations and massage were applied and a week after he was able to do light work, constantly needing rest days but working four days out of six. There was slight lameness in the hind quarters.

Three months afterwards there was a direct hit on the same stable, killing two horses outright. The remaining twelve were able to walk out and most were at work that day. Idol had a bad relapse, and now a month later is little better. He cannot back and finds difficulty in turning, the symptoms being paralysis along the spine. It is feared there will be little more work for him in London, though it is intended to give him six months' rest at grass during the summer, in the hope of a cure.

Other animals in a country district were affected after land-mines had been dropped. The rabbits—even in their holes—suffered from shock and hopped out of them aimlessly and could be picked up by hand. The cows similarly behaved in a dreamy way, refused to eat and had to be slaughtered.

Ware, Herts. H. F. BUXTON.

Parliament

No issue of domestic politics has excited more bitter controversy in recent years than the means test applied to applicants for unemployment assistance or supplementary pensions. It was natural that in the new atmosphere of the political truce, inaugurated last year by the accession to office of a National Government including most of the leaders of the former Labour Opposition, an early effort should be made to remove this serious stumbling-block to real national unity. The result was a compromise, which while still retaining a means test represents an honest and sincere attempt to get rid of the principal objections raised to its application. On Nov. 6 of last year Mr. Churchill gave a pledge to the House of Commons which has since been embodied in legislative form under the title of the Determination of Needs Bill. This measure came before the House of Commons last week for second reading. How well its draughtsmen had interpreted the Prime Minister's pledge was shown by the welcome which the bill received from all parties. It was generally agreed that the Chancellor of the Exchequer was quite justified in describing the bill as "a far-reaching reform," and in recommending it as "an important mark of our confidence in the final issue of the present struggle and of our determination not to be deterred from continuing to the limit of our ability to improve the conditions of the people." Sir Kingsley Wood explained that the first part of the bill was designed to abolish the household means test and to make the test one of personal need based on certain principles which had been indicated. The other part of the bill, he said, gave effect to the undertaking given by his predecessor, Lord Simon, in relation to war savings and contained certain modifications of the previous proposals to meet objections which had been advanced. Sir Kingsley Wood made it clear that the intention was to confer the benefit exclusively on the war saver, since the incentive would be gone if the provision applied to savings made at any time. But in order to meet genuine misunderstandings about the pledge the Government had decided that, while the distinction between war savings and other savings should be retained, the date at which it would be possible to transfer pre-war savings into war savings would be advanced to Aug. 14, 1940. The overwhelming majority of members, including the Labour Party, gave the bill their blessing. Mr. Pethick-Lawrence, a doughty critic of the means test in the past, voiced the opinion of the bulk of the Labour members that the bill went a long way to meet their wishes. "It is an immense change," he said, "and constitutes immense progress." It shifted the obligation to look after those who were old or out of work from the family and the household to the community as a whole. Mr. Pethick-Lawrence vigorously denounced the action of certain members of his party who had put on the order paper an amendment which he said would have the effect of wrecking the measure. He twitted the sponsors of the amendment with wanting to pose as champions of the oppressed, while in fact they were playing politics and doing their best to sabotage an agreed compromise solution of a complicated controversial question. He called on those who had the welfare of the unemployed and the old-age pensioners at heart to disown the amendment and support the second reading. Mr. Graham White, speaking for the Liberal Party, also agreed that the bill would bring great benefits to a number of people while it would injure none. At the same time he warned the House that a resurvey and recasting of our social services would be one of the most urgent tasks of the post-war period. The main argument of the malcontent Labour minority who supported the amendment was that the bill failed to give full effect to the Prime Minister's pledge. Mr. Ernest Bevin, the Minister of Labour, wound up the debate for the Government with a vigorous speech in which he stoutly denied that there had been any breach of faith. This point of view was amply confirmed in the division lobby where the critics could only muster 19 votes against 173 in favour of the bill.

Universities and War Damage

The position of the universities and other institutions which suffer war damage was raised at the committee stage of the War Damage Bill in the House of Commons on Feb. 11. Mr. K. W. M. PICKTHORN moved an amendment exempting "bodies of persons (whether incorporated or not) who occupy premises for, or in connexion with, the advancement of religion, education, science or research," from compulsory insurance under the business scheme of the goods on their premises but leaving them free to do so if they wish. He said that the bill attempted to distinguish between assets held for business purposes and assets held for domestic purposes, or for the purposes of living rather than of earning a living. The peculiar difficulty of the universities and colleges was that they were both a kind of home and a kind of business. No-one suggested that chattels which might be described as luxuries or amenities should be restored until the country had fully recovered from the war; but, so far as natural resources permitted, it was desirable that chattels without which the nation could not continue should be replaced.—Sir W. JOWITT, solicitor-general, said he could not accept the amendment on principle. It seemed to ask that a university should be regarded as carrying on business, and the Government thought it undesirable to exempt from compulsion persons carrying on business and to allow them to pick and choose what goods they would insure. He agreed that the objection did not apply so strongly to universities as to ordinary businesses, and the Government would use their powers under clause 45 to exempt certain classes of the non-essential equipment at universities which would have to be very carefully defined. The Government would no doubt seek the help of the universities themselves.—Mr. EDMUND HARVEY said that the assurance given by the solicitor-general would give real satisfaction to the universities, but he regretted they must be regarded as business concerns. It was true that the universities received help, but every student received more than the value of his fees. The universities were carrying on at a great loss and were only able to do so through benefactions and grants. The amendment was by leave withdrawn.

QUESTION TIME

Financing of Rest Centres

Dr. H. B. MORGAN asked the Minister of Health, with reference to the departmental circular No. 2154, what was the policy of his department with regard to the maintenance of rest-centres ready for use by homeless persons in cases of emergency through enemy action; and whether local authorities would be reimbursed expenditure for services such as heating, caretaking, and maintenance staff, if, in their discretion, staff for this purpose was considered necessary in rest centres.—Mr. H. HOLDSWORTH, Lord of the Treasury, replied: A circular was issued to county councils and county-borough councils on Feb. 6, informing them of the Government's decision to reimburse public-assistance authorities the whole of their approved expenditure, from the inception of the scheme, on providing at rest-centres for the immediate needs of people who are made homeless or leave their homes as a result of enemy action. A large measure of discretion has been allowed to local authorities in providing for this service and approved expenditure for heating, caretaking and maintenance staff, would be included in the reimbursement.

National Health Insurance Benefits

Mr. F. COLLINDRIDGE asked the Minister when it was proposed to give to the House a report of the examination referred to in his speech, on Oct. 17, 1940, that Government departments had been making into health insurance and associated questions.—Mr. ELLIS SMITH asked if he was aware of the extreme urgency of the need to increase the benefits payable under the National Health Insurance, in particular, sickness, maternity and disablement benefits; by what amounts it was intended to increase the benefits; and if he could make a statement on the matter in view of the urgency.—Mr. G. H. OLIVER asked whether he was aware of the hardship suffered by persons in receipt of disablement benefit paid under the provisions of the National Health Insurance Acts by reason of the increase in the cost of living; and whether he would consider increasing the benefit, as had been the case in many other benefits and allowances as a result of war-time conditions.—Mr. BROWN replied: While I am not as yet in a position to make a statement on this subject, I hope to do so soon.

Diphtheria Immunisation in Scotland

Mr. ALFRED EDWARDS asked the Secretary of State for Scotland how many cases of diphtheria in immunised, and non-immunised children, respectively, were recorded in the county of Aberdeen in the years 1938, 1939, and 1940; and whether any of these were fatal.—Mr. T. JOHNSTON: The required figures are:—

	1938	1939	1940
Diphtheria in non-immunised children:—			
Cases	186	149	114
Deaths	11	7	3
Diphtheria in immunised children:—			
Cases	42	16	7
Deaths	0	0	0

Mental Hospital Staff

Mr. V. MCENTEE asked the Minister of Health in what circumstances attendants at the Rampton Mental Institution were required to work approximately 113 hours a fortnight, including meal-times, as against the 88 hours per fortnight required of the staff at Broadmoor Criminal Lunatic Asylum.—Mr. BROWN replied: I am making inquiries.

Obituary

WILLIAM BULLOCH

M.D., LL.D. ABERD., F.R.S.

To many the death of Professor Bulloch, the historian of bacteriology, is the closing of an epoch, for he was a link with the great pioneers of that science and his remarkable memory and sense of the dramatic and ludicrous enabled him to discuss its historical figures as though he were one of them. History was his abiding passion, but not so much the history of trends or events as of individuals. He was acknowledged master of the bacteriological "conte drolatique," but as his scholarly and critical "History of Bacteriology" showed, he could also tell a sober story well.

Russell, London

William Bulloch was born in Aberdeen in 1868 and died in the London Hospital on Feb. 11 after an operation. He was educated at the grammar school there and at the university, and after graduating in medicine with highest honours in 1890 he visited several continental centres of learning, studied under Robert Koch, and finally returned to London to work at King's College. Later he was appointed assistant professor of pathology at University College and bacteriologist to the Lister Institute. In 1897 he was offered a chair of bacteriology and went to complete a brilliant triumvirate at the London Hospital, where Leonard Hill was already lecturing on physiology and Arthur Keith on anatomy. For the rest of his working life Bulloch remained faithful to the London, although his wide knowledge and his transparent honesty caused him to be invited elsewhere to fill important positions of trust. Thus he was chairman of the governing body of the Lister Institute, he was an original member of the Medical Research Council, and chairman of the committee which prepared its System of Bacteriology in 1930–31; he was a member of the Government's foot-and-mouth disease committee; he examined for the universities of Aberdeen, Leeds and Liverpool. Yet at the many committees he attended he seldom took an active part in a discussion—it gave him pleasure to sit and study his colleagues. Though without personal ambition he received many honours; he became a fellow of the Royal Society in 1913, he received an honorary degree from his alma mater in 1920; he was Dobell lecturer to the Royal College of Physicians in 1910, Tyndall lecturer to the Royal Institution in 1922, and Heath Clerk lecturer in 1936. On these last lectures his history of bacteriology, published in 1938, was based.

Yet with all this Bulloch remained to his students the most accessible of men and the picture we reproduce here will remind them of this middle period of his career. One of these students has recalled how on his door there hung perpetually a notice "This is my busy day," but, he goes on to say, "this neither kept Bulloch in or others out, for he was the most communicative of men, ready to exchange ideas or tell a story. Afternoon tea in the laboratory was a feast of badinage, reminiscence, and kindly mimicry, and his dinner parties at home were gastronomic and intellectual banquets not to be forgotten. The art of medicine exasperated him—it was too hit-or-miss for his scientific taste—and he professed a supreme contempt for clinicians and clinical medicine; but when anyone near to him showed the least sign of ill health he would urgently summon the best available clinical opinion." Summing up, as a contemporary and countryman, Bulloch's personal qualities, R. H. writes: "A shrewd judge of human nature and intensely interested in the foibles and vagaries of his fellow men (indeed, something of a gossip) and gifted with a dry Aberdonian humour and a caustic wit, Bulloch had an immense fund of amusing, if not always strictly accurate, stories which he poured out with an admirable power of mimicry. His shafts, however, were always directed against pretentiousness and humbug in any form; real merit he never failed to recognise and encourage. Ill health clouded his last years and dimmed his spirit, but those who knew him at his best will always remember him as a man of the highest scientific ideals and a warm-hearted, witty and entertaining friend."

Another personal tribute is from one who collaborated with Bulloch in his important work on hæmophilia:

"Those who were Bulloch's pupils or assistants can put it on record that though he did not figure to a notable extent in any great advance in knowledge, though he was not in the ordinary sense a notable teacher, nor administrator, nor man of affairs, he nevertheless exerted a great influence on the development of bacteriology in this country. Indeed most of his pupils derived sufficient from him to rise to positions of which he was proud. Bulloch was not only honoured in his own country. He was the respected and intimate friend of many of great repute abroad. When I visited Ehrlich during the '606' boom, after handing in my card with Bulloch's, I was shown into a waiting-room full of dejected visitors. I had hardly sat down before the door was flung open and a little man burst in and cried, 'Who comes from Bulloch?' He spent an hour with me before attending to his other visitors.

"It is difficult to analyse the route by which Bulloch's influence spread. He had himself no passion for research and sometimes gave the impression that he did not appreciate it; but those who knew him well came to learn that his lack of enthusiasm was due to his native caution. He had a knowledge of the literature so profound that he required very strong evidence before he accepted a current piece of work as novel. If sometimes in his earlier days his criticisms were devastating, they at least reduced the number of one's errors and promoted one's successes. He was a good director in that he was a good and trusted umpire. Even when we had left him and were getting a bit senior ourselves, we were often surprised at his knowledge of what we were doing. That we remained in his mind was often brought home to us when he told stories of our early eccentricities and improved them in the passing years. In his earlier period when he was defending with heat a new subject which sometimes challenged vested interests, he was apt to take dislikes to people, especially those in authority whose duty it is sometimes to take ruthless decisions. But during the last twenty years of his life, with a happy marriage, he developed a serenity of outlook which gave great pleasure to his friends because they thought he deserved it."

P. F.

Dr. WILLIAM TAYLOR DOYLE ALLEN, a well-known Liverpool general practitioner, died at Heswall, where he had gone to live after his retirement from practice consequent upon a serious illness. He qualified in 1895 as M.B. R.U.I., and became resident medical officer of the Parish Infirmary at Liverpool. He later held the post of assistant surgeon to the now defunct St. George's Hospital for Diseases of the Skin, and was physician to the Liverpool School for the Blind. For many years, until he retired, he practised in Mount Pleasant. He was a sound family doctor, genial and friendly and with a quiet humour which made him good company. He leaves a widow and one son, who is studying medicine.

HAROLD SCURFIELD

M.D. EDIN., D.P.H.

Dr. Harold Scurfield who died at Letchworth on Feb. 8 was for seventeen years medical officer of health for Sheffield, where his wide knowledge of public health was placed without reserve at the disposal of any cause which he championed.

Elliott & Fry

Born at Sunderland in 1863 he went to school at Birkenhead and afterwards studied medicine at Edinburgh, where he played rugby for the university. He graduated in 1889 and after a brief spell as medical officer at the Post Office he returned to his native Sunderland as surgeon and agent to the Admiralty. Six years later in 1896 he was appointed medical officer of health for the borough and port. In 1904 he moved to Sheffield, where he succeeded (Sir) John Robertson on his call to Birmingham. The health officership to the municipality was in each case combined with the chair of public health at the university. Scurfield was also examiner for the University of Oxford. He had a deep and abiding interest in the problems of tuberculosis, infant welfare and school hygiene, and in the midst of this busy life he found time to translate Nocard's "Les tuberculoses animales." In 1912 he reported to the International Congress of Tuberculosis when it met at Rome on the control of tuberculosis in the British Isles, and in 1919 he contributed the volume on infant and young child welfare to the Story of the English Public Health which was appearing under the editorship of Sir Malcolm Morris.

In appearance Scurfield was tall, austere, rather heavily bearded, and a little gruff. Within he was modest, inquiring and singularly responsive to the claims of family life and of social service. He was an untiring worker with the faculty of codifying in his mind what he read and observed so that at the appropriate moment they crystallised in a policy or an article without obvious effort. And he had that instinctive interest in little things that may sometime become important. In moving about on his lawful occasions and on constant visits to congresses at home and abroad he came to know what everyone was doing and was as familiar with Nathan Straus's home pasteuriser, Octavia Lewin's snuff and May Mellanby's rickety puppies as he was with the albuminoid ammonia in drinking water or the temperature of a refuse dump. This it was that made him welcome as a visitor at any scientific gathering and as an unsigned contributor to our columns over many years of his nominal retirement to Folkestone, when he was still as busy as in his official life.

Dr Scurfield was twice married. By his first marriage to Charlotte Bray in 1891 he had no children, by his second in 1901 to Mary Bazeley who took a prominent part in social work at Sheffield he had four sons and four daughters.

ROBERT CRAIG DUN

M.B. EDIN., F.R.C.S.

Mr. Craig Dun died at Shrewsbury on Jan. 31 after an operation. In his early career he was assistant surgeon to the Stanley Hospital, Liverpool, but soon after his appointment to the Children's Infirmary in 1900 he decided to devote himself entirely to the surgery of children. At the infirmary his colleagues included two outstanding children's physicians, Peter Davidson and Percy Marsh. Dun served the infirmary (later to become the Royal Liverpool Children's Hospital) for 32 years, until he retired on reaching the age-limit.

Dun had a broad thick-set figure, with large hands which in the operating-theatre worked with exquisite neatness and gentleness. He was compact of quietness, serene courtesy and a strength which was never aggressive. To watch him do a cleft palate or an intussusception was a delight; he was so obviously an artist, delicate in his technique, considerate to the frail tissues on which he worked. He was equipped for all types of surgery, and did beautiful work in cranial surgery among his child patients. His colleagues recognised his solid qualities by calling him to the chairmanship of the Liverpool Hospital Staffs Association, a position which he held for several not too easy years in its early days.

He was the son of Mr. Finlay Dun of Edinburgh, and was educated at Loretto. He qualified M.B. at Edinburgh University in 1893, and took his B.Sc. three years later. He did postgraduate study at Berlin and Berne, served in the South African War, and became a lieut.-colonel in the R.A.M.C. during the last war. He was a past president of the Liverpool Medical Institution. After his retirement, he went to live at Fitz Manor, near Shrewsbury, where he enjoyed his garden and the life of the countryside.

JAMES ALLAN

M.D. ABERD., D.P.H.

Dr. James Allan, who died at his home in Leeds on Jan. 28, aged 88, was until 1925 medical superintendent of St. James's Hospital. He took the M.B. at the University of Aberdeen in 1877 and the M.D. three years later. On graduation he served as house-surgeon and house-physician in the Liverpool Northern Hospital and then, for another two years, as assistant medical superintendent of the Wandsworth and Clapham Union Infirmary. He went to Leeds in 1881 as medical superintendent of the old union infirmary, later St. James's Hospital, a post which he was to hold for 44 years. To this work he devoted himself heart and soul: no man was more conscientious or diligent in the discharge of his duties. He developed and improved the nursing service at the infirmary, and instituted successful courses of lectures which paved the way for the establishment of a nurses' training-school. A first-rate administrator, he was also keenly interested in clinical work and in pathology. His favourite time for post-mortems was 10 P.M. and he expected his resident assistants to be there. He was a member of the Leeds and West Riding Medico-Chirurgical Society and its president in 1907–08, and an original member of the Leeds Pathological Club.

Tall, dignified and with a fine open countenance, Dr. Allan was an outstanding figure in any company. He was a man of few words but strong convictions, and not readily deflected from a course once decided upon. Shy and reserved, he was not easy to get to know, but he had many good friends and warm admirers, and with them he could be both witty and amusing—even sarcastic if the occasion demanded. He was buried with his forbears in his native village of Birnie, Elgin.

SIR PENDRILL VARRIER-JONES

Prof. V. H. and Mrs. Mottram write: The notices of Varrier-Jones's death have not, we think, sufficiently brought out two qualities of his which endeared him to his friends and patients. The first was a power of sustained, witty, almost frivolous but always clever conversation. We have sat at his dining table at Papworth Hall—a table made somewhat intimidating by the brass plates let into it commemorating the august Presences who had sat at it—and listened delightedly while he made fun, and exhilarating fun, of himself, the world, the flesh and even the devil. In all this he was always kindly, without malice, but as clearsighted as a hawk. We never gathered what his Weltanschauung was, nor his politics, and we believe that there was only one thing about which he had no hint of doubt and that was the idea at the back of the Papworth settlement. We think that all must grant him the truth of that magnificent conception. The other quality we noticed as he took us round the settlement was his detailed, friendly and fatherly interest in all his patients. He had the history of each at his finger tips and an insight into their psychology which certainly enabled him to turn that psychology into account in bringing about a cure of their tuberculosis. If we were pressed to answer where his greatest genius lay we think we should say just this: that he realised that tuberculosis should be attacked on every side and that not the least side was through the patient's psychology, and that he shared with royalty the gift of remembering through the years the personal details of the lives with whom his work brought him into contact.

GEOFFREY RAYMOND EDWARD MAXTED

M.B. BRIST. ; SURGEON LIEUTENANT, R.N.V.R.

Surgeon Lieutenant Geoffrey Maxted, who has been reported killed as the result of enemy action, was the younger son of Mr. E. B. Maxted, D.Sc., a lecturer in the department of chemistry in the university of Bristol. Geoffrey Maxted was educated at King's School, Canterbury, and at the University of Bristol, where he graduated in medicine in 1938. Prof. C. Bruce Perry writes: "Geoffrey Maxted obviously enjoyed all his work and exhibited a healthy scepticism to traditional views. As a student, stimulated by claims that some infections are more common among persons of certain blood-groups, he investigated the distribution of the main blood-groups in rheumatic heart disease. Although the results were negative it was a useful study carried out with care, and for this work he was awarded the Martyn memorial scholarship. The paper embodying the results was published in the *Archives of Diseases in Childhood* (1940, **15**, 181)."

After graduation he held house-appointments at the Bristol General Hospital, at Southmead Hospital and at the Leicester Royal Infirmary.

At the outbreak of war, he volunteered for the R.N.V.R. and received his commission in December, 1939. He was killed just after his 26th birthday. He loved the sea, swam and dived well, and had sailed his own small boat under many conditions which proved his courage, including a voyage in bad weather from the South Coast, round Land's End, to the Bristol Channel. He had a happy disposition and an attractive personality, and his death will be felt as a personal loss by all who came into contact with him.

ROBERT DUDLEY ROPER

M.B. CAMB. ; SURGEON LIEUTENANT, R.N.V.R.

Dr. R. D. Roper, who died on Feb. 2, aged 34, was the son of the late Dr. H. J. Roper of Leeds. He was educated at St. Edwards School, Oxford, and St. John's College, Cambridge, and qualified M.R.C.S. from Bart's in 1933. He took his B.Chir. the same year and obtained his M.B. in 1935. After qualification Roper became a casualty house-surgeon at Bart's, but he went to Charing Cross as house-surgeon to the ear, nose and throat department, and here he took up anæsthetics as a specialty, later becoming honorary anæsthetist to the hospital. He was also anæsthetist to the Hospital of SS. John and Elizabeth and to the Connaught Hospital at Walthamstow, and he had built up a growing private practice in anæsthetics. When war broke out he joined the E.M.S. but he found the work uncongenial and as soon as he could obtain his release he volunteered for service with the R.N.V.R., for he had always loved the sea. A friend tells how as a student he spent many of his happiest hours at Burnham-on-Crouch, sailing a yacht in which he had a share. Travel and the theatre were his other hobbies, and he had a large collection of books among which he delighted to spend quiet afternoons.

Dr. ELIZABETH HURDON

Miss M. M. Chadburn, chairman of the cancer committee and surgeon to the Marie Curie Hospital, writes: Elizabeth Hurdon made no claims and her distinction was the acknowledged excellence of her work. She combined the scientific and the clinical to an unusual degree, she had worked and collaborated with the distinguished staff of the Johns Hopkins Hospital and come in contact with many of the greatest medical minds of her day in America. She had done important work both in hospital and in private practice in Baltimore, she had travelled widely and knew the clinics in France, Germany, Sweden, Belgium and America. And when the Marie Curie Hospital was started the committee felt that they were fortunate in obtaining her services as radium officer and director of the work; she understood and was able successfully to contend with the difficulties attached to the rather unwilling acceptance of women's work in some quarters of the profession and she won the admiration and respect of her colleagues both male and female wherever her work was known. The Marie Curie Hospital owes much to her judgment, scientific mind and independence of thought.

Dr. Hurdon was not only a scientific worker. She was an arresting personality, a stimulating and interesting companion, a good talker, interested in what was going on everywhere in the world, and also in the small things of everyday experience, and in the fortunes and misfortunes of her friends. When she died, she had just finished a treatise on the radiological treatment of cancer which I hope may be published shortly. In one of her last letters to me, knowing all about her own illness and imminent death, she said she hoped to finish it "in time." And I believe she did.

MEDICINE AND THE LAW

Damages for Mental Shock

ONE more case has been added to the series of awards of damages for nervous shock without visible injury. At the Norfolk assizes Mrs. Englestown was given £450 general damages and £250 special damages in her action against a defendant who had negligently caused an accident which she witnessed. The Rev. Mr. Shead drove his car out of a side road and collided with a lorry driven by Mr. Hardy, a haulage contractor. Mrs. Englestown, walking on the footpath, was not touched by either vehicle; but she complained that her involuntary witnessing of the occurrence had induced a state of collapse. There was medical evidence that she was suffering from hysteria; she was afraid of cars; one doctor said that, when he attended her recently, she shrieked at the mention of a motor-car; her condition, he said, was now worse than it was two years ago. It was stated that she refused to go into an institution, and yet there was little prospect of her recovery unless there was institutional treatment. She had sued both Mr. Shead and Mr. Hardy. The judge found that the former was to blame for the accident; he ordered him to pay the whole of the damages and also Mr. Hardy's costs.

The modern decisions include Hambrook *v.* Stokes (1925), where a mother was held entitled to damages if she could prove that she suffered shock from a reasonable fear of immediate personal injury to herself or her child. If she knew that a runaway vehicle was descending a hill on which her child was standing, and if she could prove that she suffered mental shock as the reasonable consequence of the negligence of the defendant who left the vehicle in a dangerous position unattended, then she would recover damages. Lord Atkin, then Lord Justice Atkin, was prepared with characteristic courage to extend the liability. The negligent person who had failed to look after the vehicle would be liable not merely if shock resulted by reason of a mother's natural anxiety for her child, but even where a bystander felt apprehension for the safety of some third party. How much further, one wonders, can the possibilities of emotional disturbance be exploited? A writer in the *Canadian Bar Review* in 1939 cited two instances. In Bielitski *v.* Obadiak (1922) the Saskatchewan court of appeal allowed a wife to recover damages for shock caused by her having seen the defendant striking her husband. This was not far removed from the facts in Hambrook *v.* Stokes, but in the second instance the Nebraska supreme court went further. In Rosmussen *v.* Benson (1938) a dairyman had bought some sacks of bran for his cows from a seller who had forgotten that he treated the bran in one sack with arsenic in order to poison insects. The dairyman saw five of his cows die next day and worked himself into such a state of anxiety about his cows and the possible poisoning of his customers that he fell ill and subsequently died. The Nebraska court held that the dairyman's executors could recover damages from the negligent seller of bran for the shock and its consequences.

In 1939 came an English extension of principle in the case of Owens *v.* Liverpool Corporation, where a Liverpool tram negligently collided with a hearse containing a coffin. The mother and uncle of the deceased were being driven, with two other relatives, at the head of a funeral procession behind the hearse. They were not themselves in any danger; they were not anxious for the safety of any living person; but their emotions were

upset by the jolting of the coffin at a moment of natural strain. The judges refused to limit the negligent defendant's liability to cases of fear of injury to a human being. The Court of Appeal held that the right to damages for mental shock extended to any kind of nervous shock due to a defendant's negligent act. On the other hand, in an Australian case in 1939 (Chester *v.* Waverley Municipality) a strong court dismissed the claim of a mother in circumstances not unlike those in Hambrook *v.* Stokes. The municipality had dug a trench in the roadway; rain-water filled it; the town's officials and servants knew that children used to play by the trench but they failed to fence it. The mother missed her little boy and went into the street to search for him. She saw his body taken from the trench and received a severe shock which developed into illness. The Australian court refused to let the mother have damages because, in the opinion of the majority of the judges, her subsequent shock was not reasonably within the contemplation of the municipality as a consequence of its default in leaving the street in a dangerous state. Chief Justice Latham insisted that, if it was a question of the extent of a supposed duty to take care, the courts must take into account the probable consequences of the relevant act or omission. If one applies this test to the Liverpool tram case or to Mrs. Englestown's uncomfortable experience at Norwich, judges and juries will have to say whether a careless driver ought reasonably to have in mind not only the peril he constitutes to motorists and pedestrians but also the risk that potentially hysterical spectators are in the vicinity. There are villages where the inhabitants have been said to congregate at dangerous cross-roads on Sunday afternoons in the hope of a little excitement. Their experiences may have a cash value.

SCOTLAND

CARNEGIE TRUST

AT the recent annual meeting of the trust the chairman remarked that it would be idle to speak of future policy at a time when future conditions could only be guessed. For 1940–41 the Scottish universities, and those extra-mural institutions in receipt of grants during 1935–40, would normally receive an advance equal to one-fifth of their quinquennial grant, amounting in all to £50,760. But it was proposed to reduce this grant in the coming year in order to accumulate reserves to meet the heavy calls on the trust's help when peace is restored. Many research fellows and scholars who had intimated a suspension of their work would be enabled to resume it at a later date, and in the case of teachers the trustees had arranged to pay half the difference between their stipend and their service pay when called up, the other half being paid by the universities. The number of students in receipt of payment of class fees and the amount expended on them had shown an actual increase on 1939–1940, the present expenditure being £54,100. As many new applicants were accepted for the winter session 1940–41 as in each of the previous two years despite the fact that the total number of students had declined. This was because the trustees had taken into consideration the rising cost of living and had adopted a more liberal view of students' needs.

POOR LAW STIGMA

Dr. A. S. M. Macgregor has submitted to his public health committee a scheme for the complete dissociation of Glasgow municipal hospitals from the Poor Law. The scheme would extend the principle which has already been adopted for infectious diseases by making the care of sick persons generally the responsibility of the public health department; at present they must apply for poor law relief before admission. During 1940 27,500 patients were treated for a variety of illnesses in the general hospitals, all of them by way of the relieving officer; in the same year 18,408 patients were admitted directly and without formality to the fever hospitals. Dr. Macgregor feels that this differentiation stultifies the usefulness of hospitals whose equipment and specialist services have developed much since they were transferred to the local authority in 1929. Moreover it keeps the public hospitals on a status inferior to that of voluntary hospitals.

Public Health

Trichiniasis Further South

DURING the past month there have been seven known cases of trichiniasis in the urban district of Harpenden, Herts. They have been mild, with little or no gastro-intestinal upset, constipation being more common than diarrhœa. The symptoms seem to resemble closely those reported from Wolverhampton, with puffiness of the face and muscular pains and weakness. The source of infection, which is being inquired into by Prof. R. T. Leiper, has not yet been traced.

Infectious Disease in England and Wales

WEEK ENDED FEB. 8

Notifications.—The following cases of infectious disease were notified during the week: smallpox, 0; scarlet fever, 1217; whooping-cough, 3023; diphtheria, 1103; enteric fever, 7; measles (excluding rubella), 15,486; pneumonia (primary or influenzal), 1741; puerperal pyrexia, 138; cerebrospinal fever, 345; poliomyelitis, 10; polio-encephalitis, 1; encephalitis lethargica, 7; dysentery, 168; ophthalmia neonatorum, 82. No case of cholera, plague or typhus fever was notified during the week.

Deaths.—In 126 great towns there was no death from smallpox, 1 (0) from enteric fever, 3 (0) from scarlet fever, 38 (0) from whooping-cough, 32 (2) from measles, 35 (2) from diphtheria, 39 (4) from diarrhœa and enteritis under 2 years, and 261 (56) from influenza. The figures in parentheses are those for London itself.

Yarmouth reported the fatal case on enteric fever, Birmingham had 8 deaths from whooping-cough, and Liverpool 6. Fatal cases of influenza were scattered over 73 great towns, Liverpool reporting 24 deaths, Blackpool 14, Croydon 8, and no other great town more than 6.

The number of stillbirths notified during the week was 198 (corresponding to a rate of 39 per thousand total births), including 5 in London.

Incidence of Influenza

The deaths from influenza in the 126 great towns have risen from 53 (8) in the week ended Jan. 4 to 69 (9) on Jan. 11, 99 (17) on Jan. 18, 120 (22) on Jan. 25, 176 (45) on Feb. 1, and 261 (56) on Feb. 8.

The return of deaths for the great towns, 261, breaks the sequence of repetitions of the 1929 experience; then, following 179 we had 321. The ratio of 261 to 176 is almost the same as the ratio of 176 to 120 so it is very unlikely that a maximum has yet been reached, but it becomes increasingly improbable that the maximum will be of the order of magnitude of that of 1929 and not unduly optimistic to think that it will not exceed that of 1940. The age distribution of deaths is quite normal The detailed figures for London suggest that the maximum of mortality is near, that it may well be in the now current week, and that the maximum of admissions of cases of influenza, pneumonia and bronchitis to hospital is already passed. Over half the total deaths still come from the south-eastern area (including London), and it remains to be seen whether mortality in the north will increase at a faster rate.

The Inconstancy of Milk

Those who purvey milk are to some extent at the mercy of their cattle, and before now dairymen have been prosecuted for adulterating milk with water when the cow was the real culprit. The vitamins in milk can vary like other constituents. Karl Guggenheim has shown (*J. Hyg. Camb.* 1940, **40**, 690) that, in Palestine, season has a great influence over the total vitamin A content of milk, but no certain effect on vitamin C. The formed vitamin A remains roughly constant, but the carotene varies with the amount of green fodder eaten. In Palestine the carotene and vitamin A of milk correspond to those of American and European milk. Where plenty of green fodder is available, as in the valley of Jezreel, there is more vitamin A in the milk. Fluctuations in vitamin C, oddly enough, bear little or no relation to the nature of the fodder.

Medical News

University of Cambridge

At recent examinations the following were successful :—

D.M.R.E.

Part I.—Manfred Altmann, R. D. Caton, Arthur Elkeles, J. E. Glasgow, Grace M. Griffith, Max Halberstaedter and P. C. Phelps

The faculty board of medicine have coöpted Sir Walter Langdon-Brown for 1941. They have appointed Dr. W. L. H. Duckworth, Prof. H. R. Dean, F.R.S., and Dr. G. S. Graham-Smith, F.R.S., members of the appointments committee for 1941–42; and Dr. Graham-Smith, Dr. R. A. McCance, Dr. E. B. Verney, F.R.S., and Mr. W. H. Bowen members of the M.D. committee for 1941.

The following have been appointed examiners for the final M.B. for 1941 :—

Surgery.—Mr. R. Davies-Colley, Mr. R. M. Handfield-Jones, Sir Alfred Webb-Johnson, Mr. Eric Crook and Mr. Julian Taylor. The following may be called upon to act: Mr. W. H. C. Romanis, Mr. W. D. Doherty, Mr. Lancelot Bromley, Mr. G. T. Mullally, Mr. V. C. Pennell, Mr. R. M. Vick, Mr. R. H. O. B. Robinson, Mr. M. F. Nicholls, Prof. John Morley, Mr. W. H. Hey and Prof. Lambert Rogers.

Midwifery.—Mr. Aleck W. Bourne, Mr. Aubrey Goodwin, Prof. F. J. Browne, Dr. J. R. C. Canney. The following may be called upon to act: Mr. L. H. W. Williams, Mr. A. J. McNair, Dr. J. D. Barris, Mr. Victor Lack, Mr. F. W. Roques, Mr. R. A. Brews, Prof. Daniel Dougal, Dr. A. A. Gemmell, Mr. William Gilliatt and Mr. Harold Chapple.

Medicine.—Prof. John Ryle, Prof. J. W. McNee, Dr. A. E. Naish, Sir Charles Wilson, Dr. C. E. Lakin and Dr. H. Gardiner-Hill. The following may be called upon to act: Dr. F. H. Young, Dr. A. C. D. Firth, Dr. J. M. H. Campbell, Dr. T. L. Hardy, Sir Adolphe Abrahams, Dr. Donald Hunter, Dr. A. G. Evans and Prof. Crighton Bramwell.

Pharmacology.—Dr. Verney and Dr. McCance. The following may be called upon to act: Dr. Philip Hamill, Dr. E. C. Warner, Dr. J. C. Hoyle, Prof. F. R. Winton, Prof. T. H. Oliver and Dr. Geoffrey Bourne.

Pathology.—Prof. Dean and Prof. M. J. Stewart. The following may be called upon to act: Dr. E. T. C. Spooner, Dr. E. ff. Creed, Mr. R. Williamson and Prof. G. Payling Wright.

Royal College of Surgeons of England

A meeting of the council was held on Feb. 13 with Sir Hugh Lett, the president, in the chair. The Hallett prize was presented to Mr. J. D. T. Jones of Durham University. Mr. E. K. Martin of University College Hospital was re-elected a member of the court of examiners, and Mr. Ernest Hey Groves representative of the college on the General Medical Council. Dr. A. P. Cawadias was appointed Thomas Vicary lecturer for 1941.

It was decided to recognise the post of second surgical officer at the Royal Gwent Hospital, Newport, for the six months surgical practice required of candidates for the final fellowship examination.

Diplomas of membership, and diplomas in public health and in medical radiology were granted to the candidates named in the report of the comitia of the Royal College of Physicians in our issue of Feb. 8 (p. 200).

On Monday, Feb. 24, Mr. R. Davies-Colley will give the first of the spring course of Arnott Erasmus Wilson demonstrations. He will speak on inflammation of bone. Other lecturers will be: Feb. 28, Dr. A. J. E. Cave, the anatomy of the cervical plexus; March 3 and 10, Surgeon Rear-Admiral C. P. G. Wakeley, tumours of the alimentary tract; March 7, Dr. Cave, the anatomy of the brachial plexus; March 11, Mr. R. Davies-Colley, tumours of the breast, and March 14, Dr. Cave, the innervation of the body wall. The demonstrations, which are open to medical practitioners and advanced students, will be held at the College, Lincoln's Inn Fields, London, W.C.2, each day at 3 P.M.

University of Sheffield

Mr. F. W. Holdsworth has been appointed honorary lecturer in orthopædic surgery.

Prof. S. L. Baker (University of Manchester) has been appointed external examiner in pathology and bacteriology.

Prof. G. A. Clark has been elected representative of the university on the committee to be set up to draft a constitution of the proposed regional committee in connexion with the regionalisation Scheme of the British Hospitals Association and the Nuffield Provincial Hospitals Trust.

Dr. R. E. Lane has been appointed lecturer in medicine in the University of Manchester.

Pharmaceutical Students and the Army

The Pharmaceutical Society is making representations to the Ministry of Health concerning the future supply of pharmaceutical students who are at present reserved from military service when they have completed two years of training. The wording of the reservation prevents newcomers into the pharmaceutical calling from securing reservation before they are qualified, and after students of the present generation have passed their examinations there may be only women entering pharmacy. It is hoped to secure a modification of the schedule so as to enable a reasonable annual intake of students to be maintained.

Lieutenant N. B. Walker, M.B. Durh., R.A.M.C., and Lieutenant A. L. Karstaedt, M.B. Cape Town, R.A.M.C., who were previously reported missing are now posted as prisoners of war.

The M.B.E. has been awarded to Lieutenant Robert Horton, M.B. Lond., R.A.M.C., and the George Medal to Lieutenant John Monks, M.B. Manc., R.A.M.C., and Dr. William Walton, medical officer of health for West Bromwich.

The following meetings of the Davyhulme Military Hospital Medical Society have been fixed :—

Feb. 27, Major F. I. Evans, who will speak on burns; March 13, Prof. Crighton Bramwell, effort syndrome; March 27, Prof. Harry Platt, deformities of the hands and feet; and April 4, Major H. B. Jones, venereal disease in the Army and its treatment. The meetings will begin at 3 P.M. and medical men or women in any of the services (including civilian) will be welcomed.

On Feb. 20 Lord Horder, president of the Chartered Society of Massage and Medical Gymnastics, presented to the war organisation of The British Red Cross Society and the Order of St. John of Jerusalem a mobile physiotherapy unit for the treatment of men in the forces.

The unit, which is to be the first of several, will be staffed by qualified members of the society, and it contains apparatus for giving electrical and light treatments, such as galvanism, faradism, infra red rays, radiant heat, ultra violet light, and paraffin-wax baths. The apparatus and its accessories are mounted on four trolleys which can be wheeled out of the van and into each hospital.

Births, Marriages and Deaths

BIRTHS

CATHIE.—On Feb. 13, the wife of Major Ian Cathie, R.A.M.C., of Leigh, near Reigate—a son.

DAVIDSON.—On Feb. 5, at Newcastle-upon-Tyne, the wife of Dr. Whately Davidson—a daughter.

LEADER.—On Feb. 7, the wife of Dr. Reginald Leader, of Erith, Kent—a daughter.

MILLS.—On Feb. 11, at Ramsbury, Wilts, the wife of Dr. W. T. Mills—a son.

SOUTHWARD.—On Feb. 8, in Glasgow, the wife of Lieut. Ralph Southward, R.A.M.C.—a son.

STEVENS.—On Feb. 12, in Cairo, the wife of Major C. P. Stevens, R.A.M.C.—a son.

MARRIAGES

BACON—WRIGHTSON.—On Feb. 15, at York, Aidan Henry Bacon, M.B., to Gwendoline Joyce Wrightson.

GALLIE—EUSTACE.—On Feb. 5, at Sliema, Malta, John Ross Gallie, M.B., lieutenant, R.A.M.C., to Edythe Madeline Eustace.

JACK—WEEKS.—On Feb. 10, at Abbasia, Cairo, Ewen Alistair Jack, F.R.C.S.E., major, R.A.M.C., to Vivien Mary Weeks.

PYE-SMITH—FORD.—On Feb. 15, at Ilkley, Edward John Pye-Smith, M.B., captain, R.A.M.C., to Mary Audrey Ford.

STEWART—LOCHHEAD.—On Feb. 12, at Ipoh, Perak, William Muir Stewart, M.B., captain, R.A.M.C., to Helen Cargill Lochhead.

WHITE—ARNOULD.—On Feb. 11, in London, Michael William Langtry White, M.R.C.S., to Mary Seton Arnould.

DEATHS

BOGLE.—On Feb. 13, at Cheltenham, James Linton Bogle, M.D. Edin., late of Villa Vaniglia, Brodighera, aged 89.

BULLOCH.—On Feb. 11, William Bulloch, M.D., LL.D. Aberd., F.R.S., aged 72.

BURNSIDE.—On Feb. 17, at Paisley, Eustace Augustus Burnside, M.R.C.S., Colonel A.M.S. (ret.), Knight of the Order of St. John of Jerusalem, aged 80.

GRAY.—On Feb. 18, at Hindhead, Sarah Gray, F.R.C.S.I., aged 81.

KINSEY-TAYLOR.—On Feb. 12, Alfred Ernest Kinsey-Taylor, M.B. Lond., F.R.C.S., of Farnham Royal, Bucks.

STARKIE.—On Feb. 11, at Watford, Richard Francis Starkie, M.D. R.U.I., aged 88.

TICEHURST.—On Feb. 17, at Hastings, Claud Buchanan Ticehurst, B.Chir. Camb., F.R.G.S., of Appledore, Kent.

Notes, Comments and Abstracts

OWL'S-EYE VIEW OF DIET

In his Honyman Gillespie lecture delivered on Feb. 13 Dr. C. P. Stewart spoke on nutritional factors in dark adaptation. The term has been used to cover not only the adaptation of the photo-receptivity of the retina, but also the changes occurring in the nerves to the visual centre. A purely chemical process is involved in photo-receptivity.

Bright light breaks down the visual purple found in the rods while it is synthesised in the dark. The brighter the light the greater the rate of destruction. Visual purple is manufactured in the retina from several precursors, one of which is vitamin A. Bleaching of the pigment results in the reformation of the vitamin. All methods of investigation depend on exposing the eyes to a bright light and then noting how long it takes them to appreciate varying low intensities of light. Such investigations show that dark adaptation not only by the rods but also by the cones must be taken into consideration. Cone adaptation is carried out by a pigment similar to visual purple which may also be synthesised from vitamin A. Changes in the neural elements and the nerves must also be considered, and possibly visual acuity as well. It has long been known that cod-liver oil and liver are useful in the treatment of night-blindness. Surveys of the population by Jeans showed that 20% had subnormal dark adaptation correlated to a deficiency of vitamin A in the diet. Within 3 to 4 days of being put on a vitamin A-free diet subjects showed impaired dark adaptation, and after 4 to 5 weeks classical night-blindness might be present. The rate of return to normal under the influence of vitamin A is much slower than the depreciation due to the lack of it. Later research has refuted claims that there is a high degree of correlation between the dark adaptation and the vitamin-A content of the body. All that can be stated is that when dark adaptation is normal then the vitamin-A content is normal, but when dark adaptation is abnormal other factors such as abnormalities of the retina and defects in the neural elements and nerve-fibres must be taken into consideration as well as a possible defect in the vitamin supply. Vitamin C also plays a part in the chemical reactions, for it has been shown that the addition of ascorbic acid to the diet improves dark adaptation. This action is different from the action of vitamin A, for it can be shown that further improvement takes place although a full supplement of vitamin A has already been given. The metabolism of the retina simulates very closely that of brain tissue in general. Some fractions of the B complex are necessary for proper metabolic function—namely, aneurine, riboflavin, and nicotinic acid. The evidence is still incomplete, but recent work has shown that some people with subnormal dark adaptation who have failed to respond to either vitamin A or C have responded to the addition of riboflavin to the diet. Other factors affecting dark adaptation are age and changes in oxygen tension. The older the subject the higher the light threshold and the longer the time taken for the eye to become dark adapted. Reduction of oxygen tension corresponding to a height of 8,000 feet produces definite lowering of dark adaptation, while at an oxygen tension representing 18,000 feet there is severe night-blindness. The effect of reduced oxygen tension appears to be on a different mechanism than that influenced by vitamin A. With vitamin-A deficiency the rods are affected but the cones are not and the time factor is delayed. In reduced oxygen tension the time factor is unchanged, but the dark adaptation of the rods and the cones are affected equally.

ASTLEY COOPER

Thomas Wakley would turn in his grave if the centenary of his death on Feb. 12, 1841, were allowed to pass without some mention of his association with THE LANCET in its early days. Our first number, for Oct. 5, 1823, opened with the report of a lecture by Astley Cooper announced as follows:

"... and as the Lectures of Sir Astley Cooper, on the theory and practice of Surgery, are probably the best of the kind delivered in Europe, we have commenced our undertaking with the introductory address of that distinguished professor given in the theatre of St. Thomas's Hospital on Wednesday evening last."

Unlike Abernethy who followed him as THE LANCET'S chief attraction, Astley Cooper did not resent the publication of his lectures, though he felt himself "disgraced and degraded by his name forever appearing in the diurnal press," which then as now sometimes found good news value in medical reports. This led to a call on Wakley and the threat of an injunction. In his "Life and Times of Thomas Wakley" Sprigge recounts how Astley Cooper obtained admission in the character of a patient, and caught Wakley, who at the time believed the secret of his editorship to be inviolate, in the act of correcting a proof of one of the lectures in question. "Never did a small check serve a man to better purpose than did Sir Astley Cooper's little 'score'—there is no other word—serve Wakley. The great baronet was so pleased at the success of the rather transparent ruse that had gained him entrance and at the sight of Wakley's obvious discomfiture when he found his anonymity gone that any wrath he might have been cherishing was dissolved in hearty laughter." Wakley gave an assurance that Astley Cooper's name would be omitted from future reports and peace was made. Astley Cooper nevertheless strongly opposed the publication of operations as being likely to prove destructive to the reputation of the rising generation of surgeons, but he stuck loyally to his pact and took no part in the later wrangling between lecturers and THE LANCET as to whether the publication of a lecture infringed the author's copyright.

On Monday, Feb. 24, at 2 P.M., Dr. E. Wilfred Fish will address the odontology section of the Royal Society of Medicine on benign neoplasia of tooth and bone. On Feb. 25, at 2.30 P.M. at a combined meeting of the sections of medicine and ophthalmology Dr. W. D. Wykeham Brooks and Colonel F. A. Juler will open a discussion on iridocyclitis. On the same day at the same time Dr. C. P. Symonds is giving his presidential address to the section of psychiatry. On Feb. 27, at 3.30 P.M. the section of urology will hold a clinico-pathological meeting at which specimens will be shown.

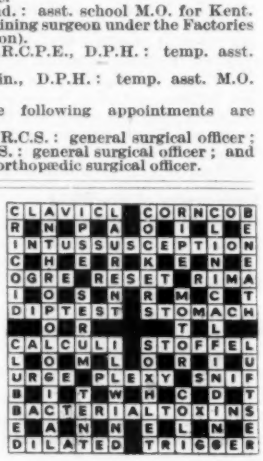
On Jan. 24 the state department of health for New York began the free distribution of sulphapyridine in an effort further to control pneumonia in the state and to help patients who are too poor to try it. The drug is being distributed for the use of registered doctors and hospitals, and a list of supply stations designated for this purpose has been drawn up. The drug will only be obtained on the request of a physician for the treatment of a specific case.

Appointments

BREWER, H. L., M.B. Melb., F.R.C.S.: R.S.O. at St. John's Hospital, Lewisham.
CUNNINGHAM SMITH, H.S., M.R.C.S.: examining surgeon under the Factories Act 1937 for Brixham, Devon.
FLYNN, MARY, M.B. N.U.I., D.P.H.: asst. school M.O. for Kent.
FRASER, J. A., M.B. Edin., D.P.H.: M.O.H. and school M.O. for the North Riding of Yorkshire.
LEDGER, MARGARET E., M.B. Lond.: asst. school M.O. for Kent.
MANGAN, W. F., L.R.C.P.I.: examining surgeon under the Factories Act 1937 for Liverpool (Garston).
MUIR, CLEMENT, M.B. Edin., M.R.C.P.E., D.P.H.: temp. asst. M.O. for Surrey.
WATTERSON, DOROTHY, M.B. Edin., D.P.H.: temp. asst. M.O. for Surrey.

Aberdeen Royal Infirmary.—The following appointments are announced:
GAYTON, W. R., M.B. Melb., F.R.C.S.: general surgical officer;
INNES, C. B., M.B. N.Z., F.R.C.S.: general surgical officer; and
CAMPBELL, M. S., M.B. Lond.: orthopædic surgical officer.

SOLUTION TO THE LANCET CROSSWORD OF FEB. 8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L O M L O R I U
URGE PLEXY SNIF
B I T W H G D T
BACTERIALTOXINS
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DILATED TRIGGER